

**2004 Annual Water Quality Report  
Carter Lake C&D Landfill  
Carter Lake, IA**

*ljd* Permit No. 78-SDP-02-80C-CND  
*XWQRP* Project No. ANDEX 04101  
November 30, 2004

1801 Industrial Circle, West Des Moines, Iowa 50265  
(515) 256-8814 Fax (515) 256-0152

**DATE STAMP**

**RECEIVED NOV 30 2004**

**BARKER LEMAR**  
ENGINEERING CONSULTANTS

November 30, 2004

Ms. Amie Hart  
Iowa Department of Natural Resources  
Wallace State Office Building  
900 East Grand Avenue  
Des Moines, IA 50319

**RE: 2004 Annual Water Quality Report  
Carter Lake C&D Landfill  
Permit No. 78-SDP-02-80C-CND (Closed)  
Project No. ANDEX 04101**

1801 INDUSTRIAL CIRCLE

WEST DES MOINES, IOWA

515.256.8814

15.256.0152 (F)

[www.barkerlemar.com](http://www.barkerlemar.com)

DES MOINES

UAD CITIES

ST.LOUIS

Dear Amie:

**BARKER LEMAR ENGINEERING CONSULTANTS (BARKER LEMAR)** has completed the water quality monitoring and assessment for the above-referenced site for the year 2004. Our services were performed in general accordance with Iowa Administrative Code (IAC) Section 113.26(4) and the current requirements for implementation of the Hydrologic Monitoring System Plan (HMSP). Please find enclosed a copy of the 2004 Annual Water Quality Report for the above-referenced site.

If you have any questions regarding this report, please contact us at 515/256-8814.

Sincerely,  
**BARKER LEMAR ENGINEERING CONSULTANTS**

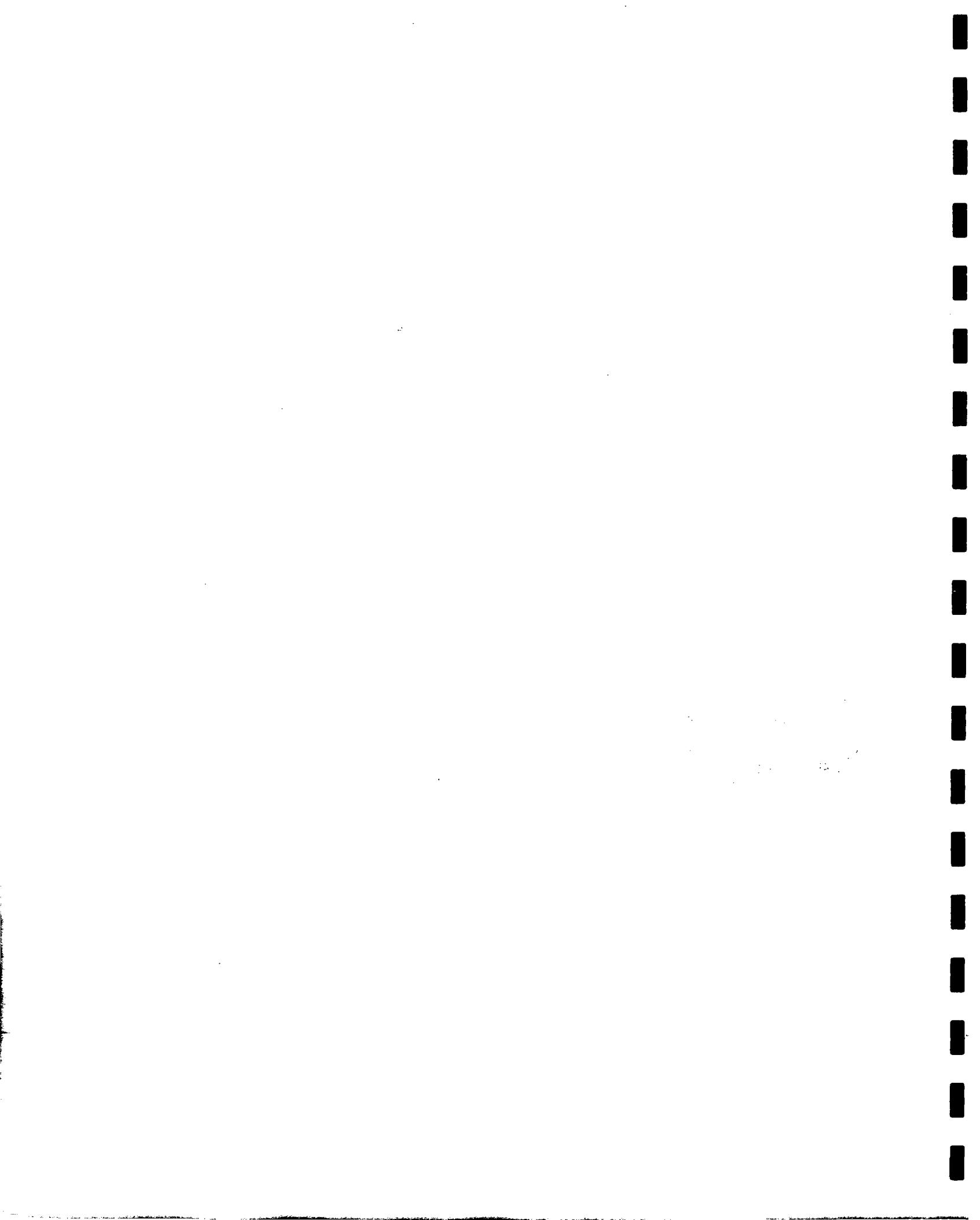


Joseph M. Herrick  
*Engineering Technician*



Christine L. Collier, E.I.  
*Senior Project Manager*

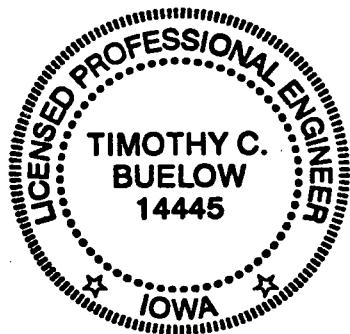
cc: Addressee  
Mr. Virgil Anderson, Anderson Excavating  
IDNR Field Office #4  
File



BARKER LEMAR  
ENGINEERING CONSULTANTS

**2004 ANNUAL WATER QUALITY REPORT  
CARTER LAKE C&D LANDFILL  
Carter Lake, Iowa  
Permit No. 78-SDP-02-80C-CND  
November 30, 2004  
Project No. ANDEX 04101**

I hereby certify that this engineering document was prepared by me or under my direct personal supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.



 11-29-04  
Timothy C. Buelow, P.E.

Date

My license renewal date is December 31, 2005.

Pages or sheets covered by this seal: All

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**BARKER LEMAR**  
ENGINEERING CONSULTANTS

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**2004 ANNUAL WATER QUALITY REPORT  
CARTER LAKE C&D LANDFILL  
Carter Lake, Iowa  
Permit No. 78-SDP-02-80C-CND  
Project No. ANDEX 04101  
November 30, 2004**

**1.0 INTRODUCTION**

BARKER LEMAR ENGINEERING CONSULTANTS (BARKER LEMAR), on behalf of Anderson Excavating, has completed the required groundwater and surface water sampling at the above-referenced site. The Carter Lake C & D Landfill has been under a closure permit since 1980. Sampling was performed in general accordance with Iowa Administrative Code (IAC) Section 113.26(4) and the provisions identified in the landfill permit. This report addresses water quality data collected during the 2004 sampling event and discusses the following issues:

- Observations made during the collection of samples;
- Results of the physical parameters measured during sample collection;
- The statistical treatment and evaluation of the chemical data;
- Changes or maintenance needed in the monitoring system; and
- Provides a summary listing of analytical data, statistical computation results, graphs of statistical exceptions, and a digital copy of the data.

**2.0 FIELD ACTIVITIES AND PROCEDURES**

Groundwater monitoring wells were developed and sampled by BARKER LEMAR personnel on October 4, 2004. This activity represents the regular annual sampling event for 2004. Water samples from seven (7) groundwater-monitoring wells were collected during this event. The surface point was dry during this event. Sampling forms for the sampling event are included in Appendix A. The general groundwater field measurement and sampling procedures used are outlined on the following page:



- Static water levels and total well depths were measured using an electronic water level indicator.
- Wells were purged of approximately three well volumes or until dry using dedicated Waterra® development/sampling pumps. Groundwater elevations were measured before and after well development.
- Field measurements of pH, temperature, and specific conductance were collected during development to be used as indicators of well conditions prior to sample collection.
- Groundwater samples were collected by using the Waterra® pumps and/or disposable bailers and by transferring the samples into laboratory-prepared containers. Bailers were used to facilitate collection of groundwater samples in the low-yield monitoring wells and surface point. The samples collected for dissolved metals analysis were field-filtered using 0.45 micron filters.
- Samples were submitted for laboratory analysis under chain-of-custody procedures. Analysis was performed as indicated in the Hydrologic Monitoring System Plan (HMSP), the Preliminary Groundwater Assessment, dated April 8, 1998, IAC 567 Sections 113.26(4)(e) and (f), and the provisions identified in the landfill permit.

### **3.0 MONITORING SYSTEM**

The groundwater monitoring system in-place at the site is comprised of seven monitoring wells (MW-1, MW-3, MW-4, MW-5, MW-6, MW-7R, MW-8) and one surface-water monitoring point (SW-1). Figure 1 shows the location of the monitoring system points.

#### **3.1 GROUNDWATER MONITORING SYSTEM**

Two distinct groundwater regimes are monitored by the corresponding monitoring wells, shown in Table 1 as follows.

**TABLE 1**  
**MONITORING WELL PLACEMENT**

REGIME	MONITORING WELLS
Grouping No. 1 (Aquifer 1)	Upgradient: MW-7R Downgradient: MW-1, MW-3, MW-5,
Grouping No. 2 (Aquifer 2)	Upgradient: MW-4, MW-6 Downgradient: MW-8

The monitoring well designations were revised in the "Preliminary Groundwater Assessment" dated April 8, 1998 submitted by **BARKER LEMAR**.

### **3.2 SURFACE WATER MONITORING**

A surface water monitoring point, SW-1 has been established for the site at the southeast corner of the landfill. It is a drainage ditch that collects the majority of the surface water from the site.

## **4.0 MONITORING SYSTEM PERFORMANCE EVALUATION**

The hydrologic monitoring system was re-evaluated to determine the reliability of the performance of the monitoring points based on the following tasks.

- The high and low groundwater levels were compared to well depth/screened interval.
- The frequency of non-flowing surface water sampling points was evaluated.
- Water level conditions in the monitoring wells were reviewed to evaluate possible changes in the hydrologic setting/flow paths due to landfilling activities.
- Well depths were measured to evaluate integrity and siltation.
- A visual inspection of well integrity was performed during the sampling event.

### **4.1 WATER LEVEL MEASUREMENTS**

The results of the water level measurements and well depth measurements are shown in Table 2 (Summary of Groundwater Levels and Well Performance) on the following page.

The October 2004 data indicate that groundwater levels range from 966.35 feet above mean sea level (ft amsl) in MW-8 to 971.88 ft amsl in MW-7R. When comparing current groundwater levels with levels observed in the previous year the fluctuations ranged from a increase in MW-7R of 0.67 feet to an increase of 2.15 feet in MW-1, with all seven wells showing an increase.

The monitoring wells in Group No. 1 were observed to have piezometric levels in the screened interval during the 2004 sampling event. The monitoring wells in Group No. 2,

**TABLE 2**  
**SUMMARY OF GROUNDWATER LEVELS AND WELL PERFORMANCE**  
**CARTER LAKE C & D LANDFILL**  
**CARTER LAKE, IOWA**  
**PERMIT NO. 78-SDP-02-80C-CND**  
**PROJECT NO. ANDEX 04101**

WELL	TOC	TOS	TD	DATUM	DATE OF MEASUREMENT		
					October 3, 2002	October 15, 2003	October 4, 2004
MW-1	985.16	977.0	23.5	GROUNDWATER LEVEL	15.87	15.50	13.35
				GROUNDWATER ELEVATION	969.29	969.66	971.81
				MEASURED WELL DEPTH	20.0	20.4	20.4
MW-3	986.3	978.0	23.5	GROUNDWATER LEVEL	18.59	19.40	18.05
				GROUNDWATER ELEVATION	967.71	966.90	968.25
				MEASURED WELL DEPTH	19.9	20.0	20.0
MW-4	985.66	935.6	58.4	GROUNDWATER LEVEL	17.98	18.95	17.43
				GROUNDWATER ELEVATION	967.68	966.71	968.23
				MEASURED WELL DEPTH	58.3	58.3	58.0
MW-5	985.82	977.9	24.5	GROUNDWATER LEVEL	17.98	19.11	17.70
				GROUNDWATER ELEVATION	967.84	966.71	968.12
				MEASURED WELL DEPTH	24.2	24.3	24.0
MW-6	985.45	938.1	57.4	GROUNDWATER LEVEL	17.96	18.95	17.57
				GROUNDWATER ELEVATION	967.49	966.50	967.88
				MEASURED WELL DEPTH	57.0	57.1	57.1
MW-7R	986.13	978.0	23.1	GROUNDWATER LEVEL	15.11	14.92	14.25
				GROUNDWATER ELEVATION	971.02	971.21	971.88
				MEASURED WELL DEPTH	23.0	23.1	23.2
MW-8	982.05	934.1	56.9	GROUNDWATER LEVEL	16.28	17.20	15.70
				GROUNDWATER ELEVATION	965.77	964.85	966.35
				MEASURED WELL DEPTH	56.6	56.4	56.4

All measurements in feet.

NA - Data are not available.

TOC - Top of casing elevation, reference for water level measurements.

TOS - Top of screen elevation.

TD - Total depth (as originally reported).

used to measure the potentiometric surface of Aquifer 2, had piezometric levels ranging from approximately 29.8 feet to 32.7 feet above the screened interval. Water levels in the monitoring wells have been sufficient to yield ground water samples during the 2004 sampling event.

#### **4.2 GROUNDWATER FLOW**

Groundwater contours were determined for Aquifer 1 and Aquifer 2 using water elevation data collected by BARKER LEMAR personnel on October 4, 2004. The October 4, 2004, groundwater contours for Aquifer 1 and Aquifer 2 are presented in Figures 1 and 2, respectively. The historical groundwater flow directions are summarized in the table on the following page.

Review of the upper aquifer groundwater flow pattern indicates that in October 2004 the general flow direction of this aquifer was in a southeasterly direction with a gradient of approximately 0.005 ft/ft. The groundwater flow direction for the potentiometric surface of the lower aquifer has been observed to exhibited a flow direction in a northwesterly direction across the site with a general gradient of 0.014 ft/ft.

#### **4.3 WELL SILTATION**

The monitoring well depths measured during the 2004 sampling event were generally within 0.5 foot of the installed depth in five wells. Monitoring well MW-1 was within 3.1 feet of the installed depth and MW-3 was within 3.5 feet of the installed depth (Table 2). Based on the ability of the dedicated purging system to remove accumulated sediment, it appears unlikely that siltation will adversely impact the groundwater monitoring points at this site. MW-1 and MW-3 were purged with Waterra pumps this year, therefore removal of accumulated sediment may be noted in the future. The measured depths of these two wells have been relatively consistent for the past three years indicating no further loss of depth.

**TABLE 3**  
**HISTORICAL GROUNDWATER FLOW DIRECTIONS**

Date	Upper Aquifer	Lower Aquifer
May 9, 1996	South	East/Southeast
October 2, 1996	East/Southeast	North*
January 27, 1997	Southeast	North*
April 15, 1997	East	North*
July 23, 1997	East	North*
October 15, 1997	East**	North*
April 6, 1998	East**	North*
October 13, 1998	Southeast	North*
April 15, 1999	Northeast	Northwest
October 7, 1999	Southeast	Northwest
October 12, 2000***	Southeast	Northwest
October 4, 2001***	Southeast	Northwest
October 3, 2002***	Southeast	Northwest
October 15, 2003***	Southeast	Northwest
October 4, 2004***	Southeast	Northwest

\* Indicates a converging flow pattern. The centralized flow direction is indicated.

\*\* Indicates a diverging flow pattern. The centralized flow direction is indicated.

\*\*\* As of 2000, the landfill was sampled annually.

#### **4.4 SAMPLING POINT OBSERVATIONS**

In general, problems regarding the integrity of the monitoring wells or sampling points were not noted.

#### **4.5 FREQUENCY OF NON-FLOWING SAMPLING POINTS**

SW-1 was not flowing during the 2004 sampling event. As this is a drainage ditch for storm water leaving the site, flow will only be present during or shortly after storm events.

## **5.0 DATA EVALUATION METHODS**

The statistical evaluation of the chemical data was completed in accordance with IAC 567 Section 113.26(6).

### **5.1 WELL GROUPING**

The groundwater regimes discussed in Section 3.1 were evaluated separately as was the surface water monitoring point. Upgradient monitoring points have been selected from each group for statistical comparison. The selection of upgradient points has been based on the "Preliminary Groundwater Assessment", submitted by Barker, Lemar and Associates, Inc. in April 1998.

### **5.2 CONTROL LIMITS**

Once the groupings were completed, the mean, standard deviation, and control limits were calculated for each of the chemical parameters in the upgradient monitoring point. The control limit represents the limit at which a statistical exceedance beyond the background concentrations has occurred. For the purpose of this evaluation, control limits are defined as the mean of the concentrations for the upgradient monitoring point plus two times the standard deviation for each parameter. A lower control limit is also used for evaluation of pH levels.

### **5.3 METHOD DETECTION LIMITS**

Many of the parameters were observed at concentrations less than the method detection limits (MDLs). The mean, standard deviation, and control limit are computed by utilizing the reporting limit value in the computations (i.e., <0.05 becomes 0.05). In situations where the upgradient monitoring point concentrations were consistently below the MDLs, the standard deviation and control limits were not calculated. It should be noted that in some cases in which control limits were not calculated for the aforementioned reason, the measured downgradient concentration exceeded the upgradient mean.

### **5.4 REGULATORY ACTION LIMITS**

In addition to evaluating the concentration in comparison to upgradient control limits, the concentrations are also compared to current United States Environmental Protection Agency (USEPA) Maximum Contaminant Levels (MCLs), Negligible Risk Levels (NRLs)

and Health Advisory Levels (HALs). IDNR guidance documents define the "action level" for groundwater as the following:

*"As defined by 567 - 133.2 (455B, 455E), action level means the HAL, if one exists. If there is no HAL, then the NRL, if one exists. If there is no HAL or NRL, then the MCL. If there is no HAL, NRL, or MCL, an action level may be established by the department based on current technical literature and recommended guidelines of the USEPA and recognized experts, on a case-by-case basis."*

The arsenic concentration in monitoring wells MW-1, MW-4, MW-5, MW-6, MW-7R and MW-8 exceeded the MCL of 0.01 mg/L in the 2004 sampling event.

## **6.0 EVALUATION OF WATER QUALITY PARAMETERS**

The analytical results of the downgradient monitoring wells and surface water points are presented in Appendix B (Summary of Groundwater Chemistry). The associated analytical data reports for October are included in Appendix C. Parameters were graphed in relation to the current mean and standard deviation for each group. Results that exceeded the current upgradient control limits are presented in the Exceedance Table in Appendix D. The graphs depicting the changes of each parameter in each downgradient monitoring point are included in Appendix E. Note, some graphs depict values that exceed the upper control limit and are not included in the summary of exceedances table. These values are not reported as exceedances due to the upper control limit being less than the detection level of that parameter's test method.

### **6.1 MONITORING WELL SUMMARY**

No statistical exceedances were measured for MW-1 in 2004. Total phenols, Total Organic Halogens (TOH), pH, ammonia nitrogen, dissolved arsenic, dissolved iron, chloride, and chemical oxygen demand (COD) were within the ranges previously observed. No new concentration maximums were observed in 2004. A new concentration minimum for specific conductance was observed in 2004. Total phenols concentrations were below the Method Detection Limits (MDL) in 2004.

No trends in concentrations were noted in the analytes.

2004 statistical exceedances were measured for chloride in **MW-3**. Total phenols, specific conductance, pH, ammonia nitrogen, dissolved arsenic, dissolved iron, chloride and COD were within the ranges previously observed. No new concentration maximums were observed in 2004. Total phenols and ammonia nitrogen concentrations were below MDLs in 2004.

A generally decreasing specific conductance concentration trend was noted beginning in October 1998. No other trends in concentrations were noted in the remaining analytes.

2004 statistical exceedances were measured for TOH, dissolved iron, and COD in **MW-5**. Specific conductance, TOH, chloride, pH, ammonia nitrogen, total phenols, dissolved arsenic, and dissolved iron were within the ranges previously observed. A new concentration maximum for COD was observed in 2004. Total phenols concentrations were below MDL in 2004.

A general increasing COD trend was noted in data beginning in April 1999. No trends in concentrations were noted in the remaining analytes.

No statistical exceedances were measured for **MW-8** in 2004. Total phenols, TOH, specific conductance, pH, ammonia nitrogen, dissolved arsenic, dissolved iron and chloride were within the ranges previously observed. No new concentration maximums were observed in 2004. A new concentration minimum was observed for COD in 2004. Total phenols concentrations were below the MDL in 2004.

A generally decreasing specific conductance concentration trend was noted beginning in October 1999. No other trends in concentrations were noted in the remaining analytes.

## **7.0 SUMMARY AND RECOMMENDATIONS**

A summary of the exceedances computed for the downgradient monitoring wells is shown in Table 4.

**TABLE 4**  
**SUMMARY OF EXCEEDANCES**

Parameter	MW-3	MW-5
Chemical Oxygen Demand		10
Chloride	10	
Dissolved Iron		10
Total Organic Halogens		10

10 = October 2004 Sampling Event

Review of the historical analytical results for chloride concentration in MW-3 indicates a recently increasing trend, only slightly above concentrations previously observed. Recent concentrations of TOH and dissolved iron in MW-5 are also below levels previously observed and do not currently indicate a clear trend. The COD concentration during the October 2004 sampling event represents a new maximum and exceedance for this analyte. Overall, dissolved arsenic concentrations have increased compared to the 2003 analytical results but are within the ranges observed previously. The arsenic action level was exceeded in five monitoring wells in 2004.

Based on these results, **BARKER LEMAR** recommends continued routine annual water sampling for the parameters listed in IAC Chapter 113.2(4)(e) and (f). **BARKER LEMAR** recommends monitoring wells MW-1, MW-3, MW-4, MW-5, MW-6, MW-7R, and MW-8 continue to be sampled annually for arsenic.

#### **8.0 GENERAL COMMENTS**

The analysis and opinions expressed in this report are based upon data obtained from the samples collected at the indicated locations and from any other information discussed in this report. This report does not reflect any variations in subsurface stratigraphy, hydrogeology, or chemical concentrations that may occur between sampling locations or across the site. Actual subsurface conditions may vary and may not become evident without further exploration.

**BARKER LEMAR** has prepared this report for the exclusive use of our client for the specific application to the project discussed. No warranty is expressly stated or implied in this report with regard to the condition of substrate and groundwater below the surface of the facility. **BARKER LEMAR** has relied upon information furnished by others as noted in the report, and **BARKER LEMAR** accepts no responsibility for any deficiency, misstatements, or inaccuracy in this report.

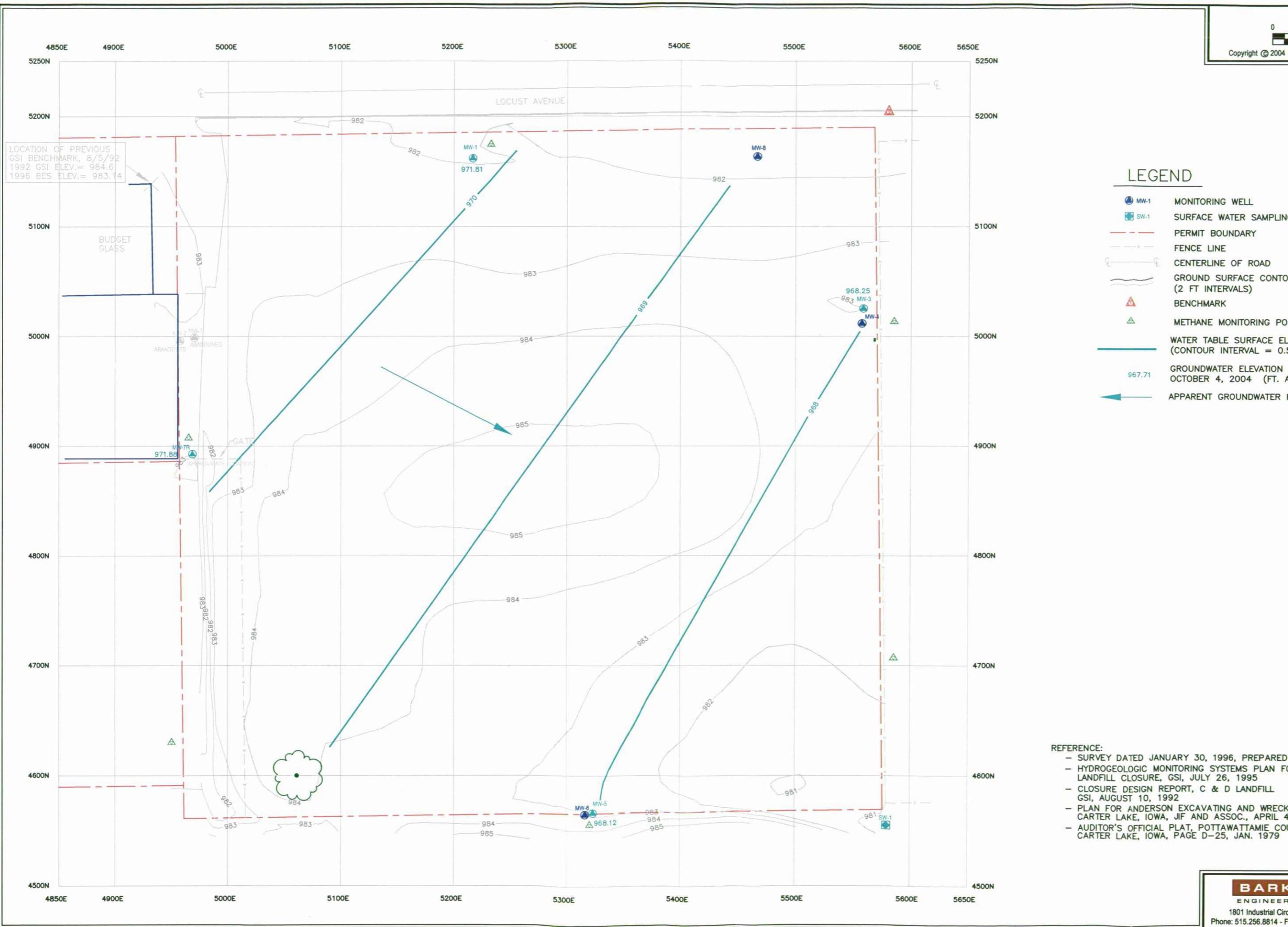
as a result of misstatements, omissions, misrepresentations, fraudulent, or inaccurate information or data provided by others.

## **9.0 REFERENCES**

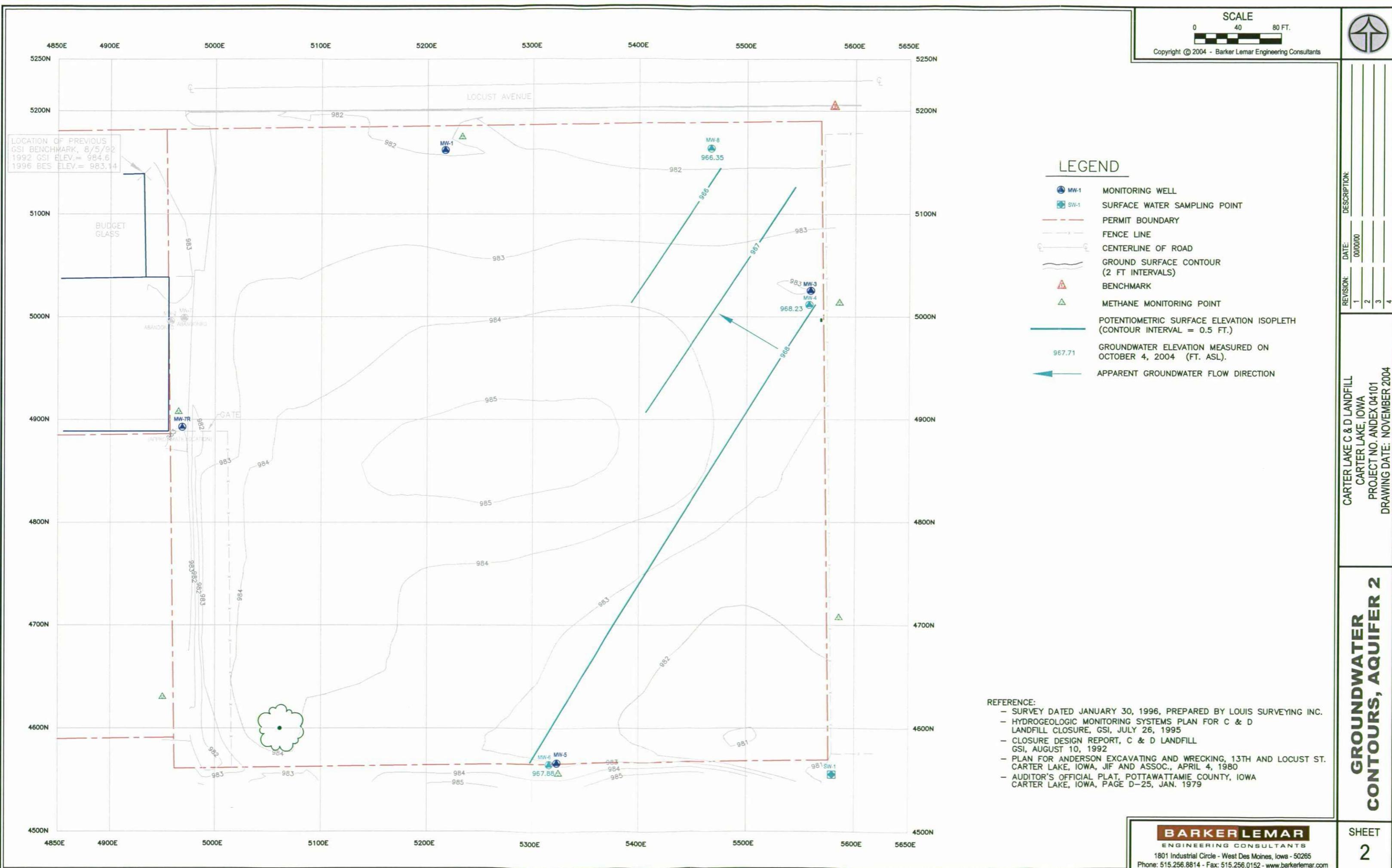
1. Iowa Department of Natural Resources. *Annual Report 1997, Registry of Hazardous Waste or Hazardous Substance Disposal Sites and Hazardous Waste Remedial Fund*. Dated January 1, 1998.
2. Barker Environmental Services, Inc. *Revised Hydrologic Monitoring System Plan, C&D Landfill Carter Lake, Iowa*. August 29, 1996.
3. Barker Environmental Services, Inc. *1997 Annual Water Quality Report, Carter Lake C&D Landfill (CLOSED)*. December 29, 1997.
4. Barker, Lemar & Associates, Inc. *Preliminary Groundwater Assessment, Carter Lake C&D Landfill (CLOSED)*. April 8, 1998.
5. Barker, Lemar and Associates, Inc. *1998 Annual Water Quality Report, Carter Lake C&D Landfill (CLOSED)*. November 16, 1998.
6. Barker, Lemar and Associates, Inc. *1999 Annual Water Quality Report, Carter Lake C&D Landfill (CLOSED)*. November 29, 1999.
7. Barker, Lemar and Associates, Inc. *2000 Annual Water Quality Report, Carter Lake C&D Landfill (CLOSED)*. November 21, 2000.
8. **BARKER LEMAR ENGINEERING CONSULTANTS**. *2001 Annual Water Quality Report, Carter Lake C&D Landfill (CLOSED)*. November 26, 2001.
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10. **BARKER LEMAR ENGINEERING CONSULTANTS**. *2003 Annual Water Quality Report, Carter Lake C&D Landfill (CLOSED)*. November 24, 2003.

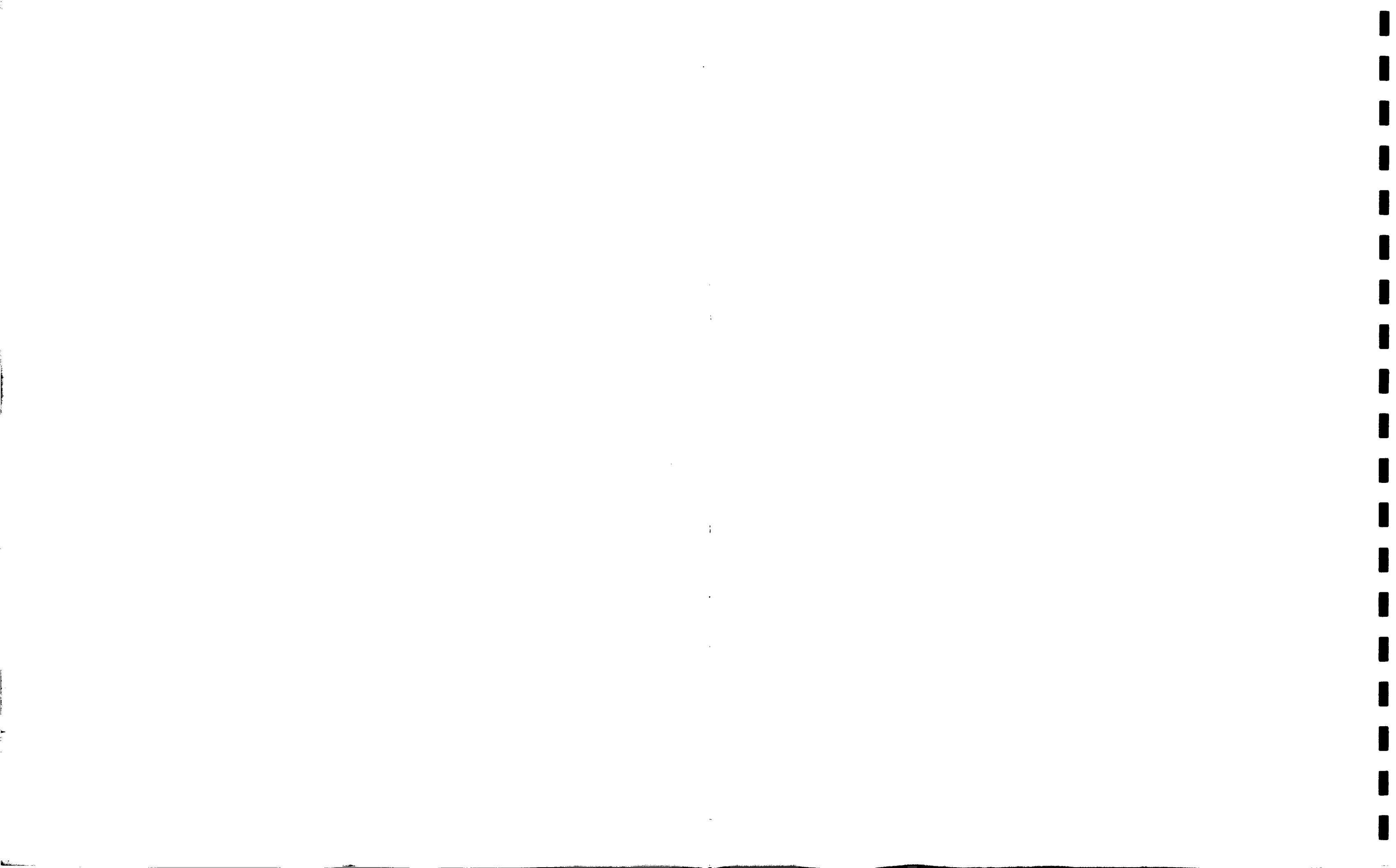
**FIGURES**  
**GROUNDWATER CONTOUR MAPS**

SCALE  
0 40 80 FT.









**APPENDIX A**  
**SAMPLING FORMS**

## LANDFILL GROUNDWATER SAMPLING DATA SHEET

**Project Information**

Project Name: Anderson Excavating  
 Project Location: Carter Lake, Iowa  
 Project Number: ANDEX 04101  
 SLF Permit No. 78-SDP-2-80C-CND  
 Weather Conditions: 59 degrees Fahrenheit, calm

**Sampling Information**

Date Sampled: 10/4/2004  
 Sampling Crew: Joe Herrick  
 Equipment: Water Level Heron  
 pH/Conductivity Hanna

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Well Purging Information														
Well No.	Date	Static Water Level (ft.)	Measured Well Depth (ft.)	Time at Start of Purging	Volume Purged (gals.)	Water Depth After Purging (ft.)	Water Depth Before Sampling (ft.)	Purging Equipment (See Note 1)	Stabilized pH (S.U.)	Stabilized Conductivity (uS/cm.)	Stabilized Temperature (C.)	Well Properly Capped (Y/N)	Litter or Standing Water (Y/N)	Comments / Time Sampled
MW-1	10/4/2004	13.35	20.4	2:45 PM	3	Dry	18.10	W	7.27	1163	16.0	Y	N	
MW-3	10/4/2004	18.05	20.0	3:35 PM	0	19.00	18.05	W	7.27	1056	17.0	Y	N	
MW-4	10/4/2004	17.43	58.0	3:55 PM	19	17.43	17.43	W	7.25	880	15.8	Y	N	
MW-5	10/4/2004	17.70	24.0	4:30 PM	3	Dry	20.99	W	6.74	1123	15.6	Y	Y	Litter
MW-6	10/4/2004	17.57	57.1	4:45 PM	17	17.52	17.52	W	7.20	968	14.4	Y	Y	Litter
MW-7R	10/4/2004	14.25	23.2	5:10 PM	4	Dry	20.61	B	6.74	1102	16.7	Y	N	
MW-8	10/4/2004	15.70	56.4	3:05 PM	19	15.70	15.70	W	7.02	1350	16.7	Y	N	
Surface Water Point Information														
Surface Water Point No.	Date	Width (ft.)	Depth (in.)	Flowrate (fps)	Point Dry (Y/N)	Water Flowing (Y/N)	Ground Discolored (Y/N)	Litter (Y/N)	Stabilized pH (S.U.)	Stabilized Conductivity (uS/cm.)	Stabilized Temperature (C.)	Water Odor (Y/N)	Water Discoloration (Y/N)	Comments / Time Sampled
SW-1	10/4/2004	NA	NA	NA	Y	N	N	N	NA	NA	NA	NA	NA	Dry

Note 1: VALID TYPES - Bailer (B), Submersible (S), Waterra (W), Vacuum Pump (V), Dedicated Bailer (DB), Other (describe in comments)

# FORM FOR GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT

Site Name	<u>Anderson Excavating</u>	Permit No.	<u>78-SDP-2-80C-CND</u>
MW/Piezometer No.	<u>MW-1</u>	Upgradient	<u></u>
		Downgradient	<u>X</u>
Name of Person Sampling	<u>Joe Herrick</u>		

## A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	<u>Yes</u>	Standing Water/Litter?	<u>No</u>
If NO, Explain	<u></u>		

## B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Top of Casing Elevation	<u>985.16</u>	feet	Ground Elevation (ft.)	<u>981.95</u>
Drilled Well Depth (ft.)	<u>23.5</u>	feet	Casing Dia. (in.)	<u>2.0</u>
Measured Well Depth (ft.)	<u>20.4</u>	feet		
Equipment Used	<u>Heron</u>			

Groundwater Level (+/- 0.01 foot below top of inner casing, MSL):

	Date	Time	Depth to Groundwater (ft)	Groundwater Elevation
Before Purging	<u>10/4/2004</u>	<u>2:45 PM</u>	<u>13.35</u>	<u>971.81</u>
After Purging	<u></u>	<u></u>	<u>Dry</u>	<u>Dry</u>
Before Sampling	<u></u>	<u></u>	<u>18.10</u>	<u>967.06</u>

## C. WELL PURGING\*

Quantity of Water Removed from Well (gallons)	<u>3</u>
No. of Well Volumes (based on current water level)	<u>2.6</u>
Was well pumped/bailed dry?	<u>Yes</u>

Equipment Used:			
Bailer Type	<u>Not Used</u>	Dedicated Bailer?	<u>No</u>
Pump Type	<u>Waterra</u>	Dedicated Pump?	<u>Yes</u>

If not dedicated, method of cleaning \_\_\_\_\_

## D. FIELD MEASUREMENTS\*

Weather Conditions 59 degrees Fahrenheit, calm

Field Measurements (after stabilization):

Temperature	<u>16.0</u>	Units	<u>Celsius</u>
Equipment Used	<u>Hanna</u>		
pH	<u>7.27</u>	Units	<u>Standard Units</u>
Equipment Used	<u>Hanna</u>		
Spec.Conductance	<u>1163</u>	Units	<u>uS/cm.</u>
Equipment Used	<u>Hanna</u>		

## COMMENTS

IDNR Form 542-1322

\*Ormit if only measuring groundwater elevations.

# FORM FOR GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT

Site Name	<u>Anderson Excavating</u>	Permit No.	<u>78-SDP-2-80C-CND</u>
MW/Piezometer No.	<u>MW-3</u>	Upgradient	<u></u>
		Downgradient	<u>X</u>
Name of Person Sampling	<u>Joe Herrick</u>		

## A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	<u>Yes</u>	Standing Water/Litter?	<u>No</u>
If NO, Explain	<u></u>		

## B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Top of Casing Elevation	<u>986.30</u>	feet	Ground Elevation (ft.)	<u>983.00</u>
Drilled Well Depth (ft.)	<u>23.5</u>	feet	Casing Dia. (in.)	<u>2.0</u>
Measured Well Depth (ft.)	<u>20.0</u>	feet		

Equipment Used	<u>Heron</u>			
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Groundwater Level (+/- 0.01 foot below top of inner casing, MSL):

	Date	Time	Depth to Groundwater (ft)	Groundwater Elevation
Before Purging	<u>10/4/2004</u>	<u>3:35 PM</u>	<u>18.05</u>	<u>968.25</u>
After Purging	<u></u>	<u></u>	<u>19.00</u>	<u>967.30</u>
Before Sampling	<u></u>	<u></u>	<u>18.05</u>	<u>968.25</u>

## C. WELL PURGING\*

Quantity of Water Removed from Well (gallons)	<u>0</u>
No. of Well Volumes (based on current water level)	<u>0</u>
Was well pumped/bailed dry?	<u>No</u>

Equipment Used:			
Bailer Type	<u>Not Used</u>	Dedicated Bailer?	<u>No</u>
Pump Type	<u>Waterra</u>	Dedicated Pump?	<u>Yes</u>

If not dedicated, method of cleaning \_\_\_\_\_

## D. FIELD MEASUREMENTS\*

Weather Conditions	<u>59 degrees Fahrenheit, calm</u>		
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Field Measurements (after stabilization):

Temperature	<u>17.0</u>	Units	<u>Celsius</u>
Equipment Used	<u>Hanna</u>		
pH	<u>7.27</u>	Units	<u>Standard Units</u>
Equipment Used	<u>Hanna</u>		
Spec.Conductance	<u>1056</u>	Units	<u>uS/cm.</u>
Equipment Used	<u>Hanna</u>		

COMMENTS	<u>Not purged prior to sampling due to insufficient water column.</u>		
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IDNR Form 542-1322

\*Omit if only measuring groundwater elevations.

**FORM FOR GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT**

Site Name	<u>Anderson Excavating</u>	Permit No.	<u>78-SDP-2-80C-CND</u>
MW/Piezometer No.	<u>MW-4</u>	Upgradient	<u>X</u>
		Downgradient	

Name of Person Sampling	<u>Joe Herrick</u>
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**A. MONITORING WELL/PIEZOMETER CONDITIONS**

Well/Piezometer Capped?	<u>Yes</u>	Standing Water/Litter?	<u>No</u>
If NO, Explain	<u>                  </u>		

**B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)**

Top of Casing Elevation	<u>985.66</u>	feet	Ground Elevation (ft.)	<u>983.57</u>
Drilled Well Depth (ft.)	<u>58.4</u>	feet	Casing Dia. (in.)	<u>2.0</u>
Measured Well Depth (ft.)	<u>58.0</u>	feet		
Equipment Used	<u>Heron</u>			

Groundwater Level (+/- 0.01 foot below top of inner casing, MSL):

	Date	Time	Depth to Groundwater (ft)	Groundwater Elevation
Before Purging	<u>10/4/2004</u>	<u>3:55 PM</u>	<u>17.43</u>	<u>968.23</u>
After Purging			<u>17.43</u>	<u>968.23</u>
Before Sampling			<u>17.43</u>	<u>968.23</u>

**C. WELL PURGING\***

Quantity of Water Removed from Well (gallons)	<u>19</u>
No. of Well Volumes (based on current water level)	<u>2.9</u>
Was well pumped/bailed dry?	<u>No</u>

Equipment Used:

Bailer Type	<u>Not Used</u>	Dedicated Bailer?	<u>No</u>
Pump Type	<u>Waterra</u>	Dedicated Pump?	<u>Yes</u>

If not dedicated, method of cleaning

**D. FIELD MEASUREMENTS\***

Weather Conditions	<u>59 degrees Fahrenheit, calm</u>		
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Field Measurements (after stabilization):

Temperature	<u>15.8</u>	Units	<u>Celsius</u>
Equipment Used	<u>Hanna</u>		
pH	<u>7.25</u>	Units	<u>Standard Units</u>
Equipment Used	<u>Hanna</u>		
Spec.Conductance	<u>880</u>	Units	<u>uS/cm.</u>
Equipment Used	<u>Hanna</u>		

**COMMENTS**

IDNR Form 542-1322

\*Omit if only measuring groundwater elevations.

**FORM FOR GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT**

Site Name	<u>Anderson Excavating</u>	Permit No.	<u>78-SDP-2-80C-CND</u>
MW/Piezometer No.	<u>MW-5</u>	Upgradient	<u>X</u>
		Downgradient	<u></u>
Name of Person Sampling	<u>Joe Herrick</u>		

**A. MONITORING WELL/PIEZOMETER CONDITIONS**

Well/Piezometer Capped?	<u>Yes</u>	Standing Water/Litter?	<u>Yes</u>
If NO, Explain	<u></u>	If YES, Explain	<u>Litter</u>

**B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)**

Top of Casing Elevation	<u>985.82</u>	feet	Ground Elevation (ft.)	<u>982.85</u>
Drilled Well Depth (ft.)	<u>24.5</u>	feet	Casing Dia. (in.)	<u>2.0</u>
Measured Well Depth (ft.)	<u>24.0</u>	feet		

Equipment Used	<u>Heron</u>		
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Groundwater Level (+/- 0.01 foot below top of inner casing, MSL):

	Date	Time	Depth to Groundwater (ft)	Groundwater Elevation
Before Purging	10/4/2004	4:30 PM	17.70	968.12
After Purging			Dry	NA
Before Sampling			20.99	964.83

**C. WELL PURGING\***

Quantity of Water Removed from Well (gallons)	<u>3</u>
No. of Well Volumes (based on current water level)	<u>2.9</u>
Was well pumped/bailed dry?	<u>Yes</u>

Equipment Used:			
Bailer Type	<u>Not Used</u>	Dedicated Bailer?	<u>No</u>
Pump Type	<u>Waterra</u>	Dedicated Pump?	<u>Yes</u>

If not dedicated, method of cleaning \_\_\_\_\_

**D. FIELD MEASUREMENTS\***

Weather Conditions	<u>59 degrees Fahrenheit, calm</u>		
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Field Measurements (after stabilization):

Temperature	<u>15.6</u>	Units	<u>Celsius</u>
Equipment Used	<u>Hanna</u>		
pH	<u>6.74</u>	Units	<u>Standard Units</u>
Equipment Used	<u>Hanna</u>		
Spec.Conductance	<u>1123</u>	Units	<u>uS/cm.</u>
Equipment Used	<u>Hanna</u>		

**COMMENTS** \_\_\_\_\_

IDNR Form 542-1322

\*Omit if only measuring groundwater elevations.

**FORM FOR GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT**

Site Name	<u>Anderson Excavating</u>	Permit No.	<u>78-SDP-2-80C-CND</u>
MW/Piezometer No.	<u>MW-6</u>	Upgradient	<u>X</u>
		Downdrgradient	

Name of Person Sampling Joe Herrick

**A. MONITORING WELL/PIEZOMETER CONDITIONS**

Well/Piezometer Capped?	<u>Yes</u>	Standing Water/Litter?	<u>Yes</u>
If NO, Explain	<u>                  </u>	If YES, Explain	<u>Litter</u>

**B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)**

Top of Casing Elevation	<u>985.45</u>	feet	Ground Elevation (ft.)	<u>983.08</u>
Drilled Well Depth (ft.)	<u>57.4</u>	feet	Casing Dia. (in.)	<u>2.0</u>
Measured Well Depth (ft.)	<u>57.1</u>	feet		

Equipment Used Heron

Groundwater Level (+/- 0.01 foot below top of inner casing, MSL):

	Date	Time	Depth to Groundwater (ft)	Groundwater Elevation
Before Purging	<u>10/4/2004</u>	<u>4:45 PM</u>	<u>17.57</u>	<u>967.88</u>
After Purging	<u>                  </u>	<u>                  </u>	<u>17.52</u>	<u>967.93</u>
Before Sampling	<u>                  </u>	<u>                  </u>	<u>17.52</u>	<u>967.93</u>

**C. WELL PURGING\***

Quantity of Water Removed from Well (gallons)	<u>17</u>
No. of Well Volumes (based on current water level)	<u>2.6</u>
Was well pumped/bailed dry?	<u>No</u>

Equipment Used:			
Bailer Type	<u>Not Used</u>	Dedicated Bailer?	<u>No</u>
Pump Type	<u>Waterra</u>	Dedicated Pump?	<u>Yes</u>

If not dedicated, method of cleaning                   

**D. FIELD MEASUREMENTS\***

Weather Conditions 59 degrees Fahrenheit, calm

Field Measurements (after stabilization):

Temperature	<u>14.4</u>	Units	<u>Celsius</u>
Equipment Used	<u>Hanna</u>		
pH	<u>7.20</u>	Units	<u>Standard Units</u>
Equipment Used	<u>Hanna</u>		
Spec.Conductance	<u>968</u>	Units	<u>uS/cm.</u>
Equipment Used	<u>Hanna</u>		

COMMENTS                   

IDNR Form 542-1322

\*Omit if only measuring groundwater elevations.

# FORM FOR GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT

Site Name	<u>Anderson Excavating</u>	Permit No.	<u>78-SDP-2-80C-CND</u>
MW/Piezometer No.	<u>MW-7R</u>	Upgradient	<u>X</u>
		Downgradient	

Name of Person Sampling	<u>Joe Herrick</u>
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## A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	<u>Yes</u>	Standing Water/Litter?	<u>No</u>
If NO, Explain	<u>                  </u>		

## B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Top of Casing Elevation	<u>986.13</u>	feet	Ground Elevation (ft.)	<u>983.22</u>
Drilled Well Depth (ft.)	<u>23.1</u>	feet	Casing Dia. (in.)	<u>2.0</u>
Measured Well Depth (ft.)	<u>23.2</u>	feet		

Equipment Used	<u>Heron</u>
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Groundwater Level (+/- 0.01 foot below top of inner casing, MSL):

	Date	Time	Depth to Groundwater (ft)	Groundwater Elevation
Before Purging	10/4/2004	5:10 PM	14.25	971.88
After Purging			Dry	NA
Before Sampling			20.61	965.52

## C. WELL PURGING\*

Quantity of Water Removed from Well (gallons)	<u>4</u>
No. of Well Volumes (based on current water level)	<u>2.8</u>
Was well pumped/bailed dry?	<u>Yes</u>

Equipment Used:			
Bailer Type	<u>Bailer</u>	Dedicated Bailer?	<u>No</u>
Pump Type	<u>Not Used</u>	Dedicated Pump?	<u>No</u>

If not dedicated, method of cleaning	<u>disposable bailer</u>
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## D. FIELD MEASUREMENTS\*

Weather Conditions	<u>59 degrees Fahrenheit, calm</u>
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Field Measurements (after stabilization):

Temperature	<u>16.7</u>	Units	<u>Celsius</u>
Equipment Used	<u>Hanna</u>		
pH	<u>6.74</u>	Units	<u>Standard Units</u>
Equipment Used	<u>Hanna</u>		
Spec.Conductance	<u>1,102</u>	Units	<u>uS/cm.</u>
Equipment Used	<u>Hanna</u>		

## COMMENTS

IDNR Form 542-1322

\*Omit if only measuring groundwater elevations.

# FORM FOR GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT

Site Name	<u>Anderson Excavating</u>	Permit No.	<u>78-SDP-2-80C-CND</u>
MW/Piezometer No.	<u>MW-8</u>	Upgradient	<u></u>
		Downgradient	<u>X</u>

Name of Person Sampling Joe Herrick

## A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	<u>Yes</u>	Standing Water/Litter?	<u>No</u>
If NO, Explain	<u></u>		

## B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Top of Casing Elevation	<u>982.05</u>	feet	Ground Elevation (ft.)	<u>979.05</u>
Drilled Well Depth (ft.)	<u>56.9</u>	feet	Casing Dia. (in.)	<u>2.0</u>
Measured Well Depth (ft.)	<u>56.4</u>	feet		
Equipment Used	<u>Heron</u>			

Groundwater Level (+/- 0.01 foot below top of inner casing, MSL):

	Date	Time	Depth to Groundwater (ft)	Groundwater Elevation
Before Purging	<u>10/4/2004</u>	<u>3:05 PM</u>	<u>15.70</u>	<u>966.35</u>
After Purging			<u>15.70</u>	<u>966.35</u>
Before Sampling			<u>15.70</u>	<u>966.35</u>

## C. WELL PURGING\*

Quantity of Water Removed from Well (gallons)	<u>19</u>
No. of Well Volumes (based on current water level)	<u>2.9</u>
Was well pumped/bailed dry?	<u>No</u>

Equipment Used:			
Bailer Type	<u>Not Used</u>	Dedicated Bailer?	<u>No</u>
Pump Type	<u>Waterra</u>	Dedicated Pump?	<u>Yes</u>

If not dedicated, method of cleaning

## D. FIELD MEASUREMENTS\*

Weather Conditions 59 degrees Fahrenheit, calm

Field Measurements (after stabilization):

Temperature	<u>16.7</u>	Units	<u>Celsius</u>
Equipment Used	<u>Hanna</u>		
pH	<u>7.02</u>	Units	<u>Standard Units</u>
Equipment Used	<u>Hanna</u>		
Spec. Conductance	<u>1350</u>	Units	<u>uS/cm.</u>
Equipment Used	<u>Hanna</u>		

## COMMENTS

IDNR Form 542-1322

\*Omit if only measuring groundwater elevations.

# FORM FOR SURFACE WATER SAMPLING

Site Name	<u>Anderson Excavating</u>	Permit No.	<u>78-SDP-2-80C-CND</u>
Surface Monitoring Point No.	<u>SW-1</u>	Date	<u>January 0, 1900</u>
Name of Person Sampling		<u>Joe Herrick</u>	

## A. TYPE OF MONITORING POINT

Stream	<u>                </u>	Open Tile	<u>                </u>
Road Ditch	<u>                </u>	Tile with Riser	<u>                </u>
Drainage Ditch	<u>X</u>	Other	<u>                </u>

## B. PURPOSE OF MONITORING POINT

Upstream	<u>                </u> feet	Downstream	<u>                </u>
Within Landfill	<u>                </u> feet	Other	<u>X</u>

## C. MONITORING POINT CONDITIONS

General description/condition of monitoring point

Surface water drainage ditch along south portion of the site.

Was monitoring point dry?	<u>Yes</u>	Too little water to sample?	<u>Yes</u>
Was water flowing?	<u>No</u>	If yes, estimate quantity	<u>NA</u>
		If yes, estimate depth	<u>NA</u>

Was water discolored?	<u>NA</u>
Does water have odor?	<u>NA</u>
Was ground discolored?	<u>No</u>
Litter present?	<u>No</u>

Comments

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## D. FIELD MEASUREMENTS\*

Weather Conditions      59 degrees Fahrenheit, calm

Field Measurements (after stabilization):

Temperature	<u>NA</u>	Units	<u>Celsius</u>
Equipment Used	<u>Hanna</u>		
pH	<u>NA</u>	Units	<u>Standard units</u>
Equipment Used	<u>Hanna</u>		
Spec. Conductance	<u>NA</u>	Units	<u>uS/cm.</u>
Equipment Used	<u>Hanna</u>		

**COMMENTS**

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IDNR Form 542-1324

\*Omit if only measuring groundwater elevations.

**FIGURES**  
**GROUNDWATER CONTOUR MAPS**

**APPENDIX B**  
**SUMMARY OF GROUNDWATER CHEMISTRY**

## Summary of Groundwater Chemistry

Carter Lake Construction and Demolition Landfill - 78-SDP-02-80

Parameter	Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-7R	MW-8
		DN1	UP2	DN1	UP2	DN1	UP2	UP1	UP1	DN2
Chemical Oxygen Demand - mg/L	10/2/1996	70.0	19.0	45.0	29.0	48.0	130	120	NM	46.0
	1/27/1997	62.0	15.0	54.0	33.0	76.0	150	120	NM	46.0
	4/15/1997	94.0	8.70	60.0	40.0	55.0	110	100	NM	33.0
	7/23/1997	58.0	6.80	85.0	18.0	47.0	100	110	NM	63.0
	10/15/1997	64.0	57.0	45.0	15.0	31.0	110	120	NM	55.0
	4/6/1998	110	44.0	48.0	17.0	62.0	52.0	77.0	NM	110
	10/13/1998	91.0	50.0	150	27.0	92.0	66.0	100	NM	100
	4/15/1999	89.0	NM	66.0	21.0	42.0	51.0	NM	NM	98.0
	10/7/1999	80.0	NM	49.0	22.0	69.0	89.0	NM	NM	110
	10/12/2000	56.0	NM	30.0	19.0	76.0	50.0	NM	NM	54.0
	10/4/2001	41.0	NM	NM	39.0	109	67.0	85.0	NM	40.0
	10/3/2002	51.0	NM	28.0	31.0	86.0	144	100	NM	28.0
	10/15/2003	120	NM	36.0	24.0	96.0	180	NM	100	30.0
	10/4/2004	53.0	NM	31.0	8.10	150	140	NM	69.0	18.0
Chloride - mg/L	10/2/1996	160	31.0	160	69.0	64.0	180	94.0	NM	86.0
	1/27/1997	150	36.0	140	65.0	85.0	140	63.0	NM	83.0
	4/15/1997	120	34.0	150	70.0	62.0	150	64.0	NM	84.0
	7/23/1997	140	36.0	120	61.0	60.0	150	110	NM	130
	10/15/1997	130	88.0	880	57.0	54.0	120	86.0	NM	76.0
	4/6/1998	110	70.0	78.0	62.0	50.0	75.0	89.0	NM	210
	10/13/1998	110	84.0	100	70.0	92.0	96.0	160	NM	160
	4/15/1999	48.0	NM	64.0	70.0	16.0	81.0	NM	NM	160
	10/7/1999	160	NM	130	70.0	99.0	140	NM	NM	160
	10/12/2000	244	NM	120	62.0	100	100	NM	NM	112
	10/4/2001	221	NM	NM	98.0	72.0	118	57.0	NM	112
	10/3/2002	215	NM	97.0	61.0	75.0	166	50.0	NM	63.0
	10/15/2003	243	NM	141	46.9	75.3	219	NM	56.3	74.1
	10/4/2004	97.2	NM	169	47.0	52.4	196	NM	48.9	88.2
Iron, Dissolved - mg/L	10/2/1996	21.0	14.0	18.0	30.0	46.0	36.0	5.50	NM	30.0
	1/27/1997	22.0	14.0	21.0	32.0	75.0	34.0	6.90	NM	27.0
	4/15/1997	34.0	26.0	24.0	36.0	52.0	32.0	8.20	NM	30.0
	7/23/1997	21.0	13.0	62.0	27.0	53.0	30.0	11.0	NM	41.0
	10/15/1997	27.0	40.0	36.0	29.0	42.0	36.0	17.0	NM	42.0
	4/6/1998	44.0	27.0	25.0	29.0	24.0	27.0	28.0	NM	49.0
	10/13/1998	19.0	18.0	29.0	28.0	50.0	25.0	22.0	NM	50.0
	4/15/1999	11.0	NM	8.00	28.0	<0.1000	22.0	NM	NM	43.0
	10/7/1999	30.0	NM	28.0	33.0	20.0	29.0	NM	NM	50.0
	10/12/2000	24.5	NM	2.69	27.6	20.5	20.9	NM	NM	35.5
	10/4/2001	21.4	NM	NM	25.1	33.8	23.4	15.3	NM	27.6
	10/3/2002	15.8	NM	1.02	25.7	20.7	34.3	10.3	NM	36.3
	10/15/2003	1.76	NM	<0.1000	21.6	3.12	0.1300	NM	11.3	<0.1000
	10/4/2004	17.0	NM	0.4100	24.0	38.0	31.0	NM	32.0	40.0

## Summary of Groundwater Chemistry

Carter Lake Construction and Demolition Landfill - 78-SDP-02-80

Parameter	Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-7R	MW-8
		DN1	UP2	DN1	UP2	DN1	UP2	UP1	UP1	DN2
Nitrogen, Ammonia - mg/L HAL - 30 mg/L	10/2/1996	0.5800	1.20	0.3500	2.70	1.20	3.00	2.00	NM	2.70
	1/27/1997	0.5400	1.00	<0.2000	2.30	0.6600	3.40	1.20	NM	1.90
	4/15/1997	1.70	1.30	0.5800	2.40	0.8300	3.60	1.90	NM	2.40
	7/23/1997	1.10	1.30	2.00	2.50	0.5400	3.20	2.00	NM	2.40
	10/15/1997	1.30	2.10	0.6700	2.40	0.6400	2.60	1.60	NM	2.30
	4/6/1998	3.00	3.90	0.9800	3.00	0.4000	3.40	2.00	NM	1.90
	10/13/1998	1.60	2.90	1.10	2.90	0.6300	3.30	3.20	NM	2.50
	4/15/1999	1.50	NM	0.2200	3.10	<0.2000	3.40	NM	NM	2.70
	10/7/1999	3.60	NM	0.7900	3.20	0.7300	3.00	NM	NM	2.70
	10/12/2000	<1.00	NM	<1.00	2.40	<1.00	3.00	NM	NM	2.20
	10/4/2001	2.40	NM	NM	2.50	<1.00	3.80	5.30	NM	2.10
	10/3/2002	1.90	NM	<1.00	<1.00	<1.00	3.80	6.10	NM	2.50
	10/15/2003	1.23	NM	<0.2000	2.05	0.5000	4.23	NM	1.98	1.98
	10/4/2004	3.19	NM	<0.2000	2.60	0.4900	6.51	NM	2.64	2.30
pH - S.U.	10/2/1996	7.10	7.37	7.03	7.24	7.75	7.80	8.10	NM	7.20
	1/27/1997	6.87	7.38	7.10	6.98	6.84	6.86	7.48	NM	6.73
	4/15/1997	7.46	7.49	7.75	7.17	7.34	7.20	7.32	NM	7.55
	7/23/1997	6.55	6.99	7.62	6.95	7.07	6.98	7.12	NM	7.38
	10/15/1997	7.07	7.15	6.94	6.83	7.27	7.05	6.99	NM	7.01
	4/6/1998	7.27	7.38	7.05	6.97	7.44	6.92	7.08	NM	7.13
	10/13/1998	7.11	7.20	7.04	6.80	7.33	6.89	7.12	NM	7.30
	4/15/1999	6.23	NM	6.84	6.56	6.71	6.23	NM	NM	6.12
	10/7/1999	5.51	NM	5.72	5.73	6.26	5.74	NM	NM	5.16
	10/12/2000	5.45	NM	5.79	5.37	5.82	5.67	NM	NM	5.53
	10/4/2001	5.67	NM	NM	7.02	5.65	6.73	NM	5.21	6.85
	10/3/2002	6.71	NM	6.89	6.93	6.68	6.94	NM	6.99	6.91
	10/15/2003	6.18	NM	6.78	6.39	6.48	6.69	NM	6.30	6.29
	10/4/2004	7.27	NM	7.27	7.25	6.74	7.20	NM	6.74	7.02
Specific Conductance - umhos/cm	1/27/1997	1,670	1,410	1,380	1,930	2,950	2,130	2,480	NM	2,190
	4/15/1997	3,600	2,220	3,340	3,230	3,170	2,350	3,100	NM	2,820
	7/23/1997	1,990	2,820	3,090	3,180	2,820	2,730	2,640	NM	2,900
	10/15/1997	2,760	3,440	3,220	2,320	2,020	2,200	3,110	NM	2,760
	4/6/1998	2,630	3,060	3,090	2,420	1,880	1,950	3,240	NM	2,520
	10/13/1998	1,710	3,500	3,360	2,480	1,960	2,020	3,240	NM	2,610
	4/15/1999	2,360	NM	2,940	2,500	1,540	1,940	NM	NM	3,030
	10/7/1999	1,350	NM	1,900	1,240	1,460	960	NM	NM	1,750
	10/12/2000	2,090	NM	2,680	2,190	2,480	1,520	NM	NM	2,030
	10/4/2001	1,520	NM	NM	1,290	1,480	1,080	NM	1,280	1,280
	10/3/2002	1,625	NM	1,578	1,458	1,941	1,787	NM	1,760	1,547
	10/15/2003	1,259	NM	740	981	814	776	NM	785	1,166
	10/4/2004	1,163	NM	1,056	880	1,123	968	NM	1,102	1,350

## Summary of Groundwater Chemistry

Carter Lake Construction and Demolition Landfill - 78-SDP-02-80

Parameter	Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-7R	MW-8
		DN1	UP2	DN1	UP2	DN1	UP2	UP1	UP1	DN2
Total Organic Halogens - mg/L	10/2/1996	0.0320	<0.0100	0.0460	0.0430	0.0620	0.0370	0.0390	NM	0.0270
	10/15/1997	0.0300	0.0230	0.0240	0.0110	0.0200	<0.0100	0.0210	NM	0.0310
	10/13/1998	0.0600	0.0140	0.0460	0.0140	0.0440	<0.0100	0.0750	NM	0.0300
	10/7/1999	0.0339	NM	0.0542	0.0123	0.0403	0.0226	NM	NM	0.0423
	10/12/2000	0.0400	NM	0.1000	0.0300	0.2200	0.0100	NM	NM	0.0200
	10/4/2001	0.1130	NM	NM	0.0450	0.0920	<0.0100	<0.0100	NM	0.0130
	10/3/2002	0.0260	NM	0.0970	0.0260	0.1110	<0.0100	0.0660	NM	0.0180
	10/15/2003	0.0240	NM	0.0220	<0.0100	0.0590	0.0350	NM	0.0140	0.0290
	10/4/2004	0.0770	NM	0.0320	0.0100	0.0940	0.0120	NM	0.0210	0.0390
	10/2/1996	0.0230	0.0220	0.0220	<0.0200	<0.0200	0.0210	<0.0200	NM	0.0230
Total Phenols - mg/L HAL - 2 mg/L	10/15/1997	0.5450	0.2020	<0.0200	<0.0200	0.5860	0.3700	0.0480	NM	0.0930
	10/13/1998	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	NM	<0.0200
	10/7/1999	0.0200	NM	<0.0200	<0.0200	<0.0200	<0.0200	NM	NM	<0.0200
	10/12/2000	<0.1000	NM	<0.1000	<0.1000	<0.1000	<0.1000	NM	NM	<0.1000
	10/4/2001	<0.1000	NM	NM	<0.1000	<0.1000	<0.1000	<0.1000	NM	<0.1000
	10/3/2002	<0.1000	NM	<0.1000	<0.1000	<0.1000	<0.1000	<0.1000	NM	<0.1000
	10/15/2003	0.0220	NM	<0.0200	<0.0200	<0.0200	<0.0200	NM	<0.0200	0.1960
	10/4/2004	<0.0200	NM	<0.0200	<0.0200	<0.0200	<0.0200	NM	<0.0200	<0.0200
	10/2/1996	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	1/27/1997	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NM	<0.5
Benzene - ug/L MCL - 5 ug/L NRL - 1 ug/L	4/15/1997	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NM	<0.5
	7/23/1997	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NM	<0.5
	10/2/1996	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	1/27/1997	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	NM	<0.3
	4/15/1997	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	NM	<0.3
Carbon Tetrachloride - ug/L MCL - 5 ug/L NRL - 0.3 ug/L	7/23/1997	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.6	NM	<0.3
	10/2/1996	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	1/27/1997	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	NM	<0.3
	4/15/1997	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	NM	<0.3
	7/23/1997	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.6	NM	<0.3
1,1-Dichloroethene - ug/L	10/2/1996	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	1/27/1997	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NM	<2.0
	4/15/1997	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NM	<2.0
	7/23/1997	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	NM	<2.0
	10/2/1996	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
1,2-Dichloroethane - ug/L MCL - 5 ug/L NRL - 0.4 ug/L	1/27/1997	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	NM	<0.4
	4/15/1997	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	NM	<0.4
	7/23/1997	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.8	NM	<0.4
	10/2/1996	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	1/27/1997	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
1,4-Dichlorobenzene - ug/L MCL - 75 ug/L HAL - 75 ug/L	4/15/1997	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	7/23/1997	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	NM	<1.0
	10/2/1996	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	1/27/1997	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	4/15/1997	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0

## Summary of Groundwater Chemistry

Carter Lake Construction and Demolition Landfill - 78-SDP-02-80

Parameter	Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-7R	MW-8
		DN1	UP2	DN1	UP2	DN1	UP2	UP1	UP1	DN2
1,1,1-Trichloroethane - ug/L MCL - 200 ug/L HAL - 200 ug/L	10/2/1996	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	1/27/1997	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	4/15/1997	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	7/23/1997	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	NM	<1.0
Trichloroethylene - ug/L MCL - 5 ug/L NRL - 3 ug/L	10/2/1996	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	1/27/1997	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	4/15/1997	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NM	<1.0
	7/23/1997	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	NM	<1.0
Arsenic, Dissolved - mg/L MCL - 0.01 mg/L	10/2/1996	0.0215	<0.0010	0.0294	0.0384	0.0509	0.1194	0.0033	NM	0.0188
	1/27/1997	0.0220	<0.0010	0.0223	0.0314	0.0887	0.0662	<0.0010	NM	0.0080
	4/15/1997	0.0195	0.0239	0.0270	0.0425	0.0596	0.0752	0.0042	NM	0.0133
	7/23/1997	0.0281	<0.0010	0.0387	0.0339	0.0413	0.0745	0.0011	NM	0.0168
	10/15/1997	0.0332	0.0120	0.0354	0.0269	0.0410	0.0682	0.0035	NM	0.0141
	4/6/1998	NM	NM	0.0025	NM	0.0080	0.0352	NM	NM	0.0090
	10/13/1998	NM	NM	0.0307	NM	0.0484	0.0607	NM	NM	0.0157
	4/15/1999	NM	NM	0.0118	NM	0.0010	0.0492	NM	NM	0.0148
	10/7/1999	NM	NM	0.0086	NM	0.0264	0.0673	NM	NM	0.0175
	10/12/2000	NM	NM	<0.0010	NM	0.0200	0.0670	NM	NM	0.0160
	10/4/2001	0.0130	NM	NM	0.0260	0.0380	0.0580	0.0250	NM	0.0160
	10/3/2002	0.0110	NM	0.0050	0.0250	0.0150	0.0600	0.0220	NM	0.0160
	10/15/2003	<0.0010	NM	0.0019	0.0229	0.0018	0.0159	NM	0.0114	0.0021
	10/4/2004	0.0124	NM	0.0027	0.0216	0.0234	0.0678	NM	0.0204	0.0170
Barium, Dissolved - mg/L MCL - 2 mg/L HAL - 2 mg/L	10/2/1996	0.0750	0.3280	0.0480	0.1700	0.0460	1.00	0.6810	NM	0.2300
	1/27/1997	0.0740	0.3180	0.0460	0.2020	0.0520	1.10	0.6200	NM	0.2100
	4/15/1997	0.1730	0.1340	0.0640	0.2180	0.0480	0.9534	0.3730	NM	0.2100
	7/23/1997	0.0910	0.3320	0.0730	0.1810	0.0440	0.8970	0.6780	NM	0.1700
Cadmium, Dissolved - mg/L MCL - 0.005 mg/L HAL - 0.005 mg/L	10/2/1996	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	NM	<0.0005
	1/27/1997	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	NM	<0.0005
	4/15/1997	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	NM	<0.0005
	7/23/1997	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	NM	<0.0005
Chromium, Dissolved - mg/L MCL - 0.1 mg/L	10/2/1996	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0032	NM	<0.0020
	1/27/1997	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	NM	<0.0020
	4/15/1997	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0023	NM	<0.0020
	7/23/1997	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	NM	<0.0020
Copper, Dissolved - mg/L MCL - 1.3 mg/L	10/2/1996	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	NM	<0.0200
	1/27/1997	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	NM	<0.0200
	4/15/1997	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0500	<0.0500	NM	<0.0200
	7/23/1997	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	NM	<0.0200
Lead, Dissolved - mg/L MCL - 0.015 mg/L	10/2/1996	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NM	<0.0050
	1/27/1997	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NM	0.0055
	4/15/1997	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NM	<0.0050
	7/23/1997	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	NM	<0.0040

## Summary of Groundwater Chemistry

Carter Lake Construction and Demolition Landfill - 78-SDP-02-80

Parameter	Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-7R	MW-8
		DN1	UP2	DN1	UP2	DN1	UP2	UP1	UP1	DN2
Magnesium, Dissolved - mg/L	10/2/1996	140	70.0	130	100	140	110	150	NM	130
	1/27/1997	130	67.0	120	120	200	110	140	NM	120
	4/15/1997	150	130	200	130	210	98.0	92.0	NM	140
	7/23/1997	120	64.0	210	94.0	190	92.0	140	NM	130
Mercury, Dissolved - mg/L MCL - 0.002 mg/L HAL - 0.002 mg/L	10/2/1996	<0.0002	<0.0002	<0.0002	0.0003	0.0003	0.0003	<0.0002	NM	<0.0002
	1/27/1997	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NM	<0.0002
	4/15/1997	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NM	<0.0002
	7/23/1997	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NM	<0.0002
Zinc, Dissolved - mg/L HAL - 2 mg/L	10/2/1996	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	NM	<0.0200
	1/27/1997	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	NM	<0.0200
	4/15/1997	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0500	<0.0500	NM	<0.0200
	7/23/1997	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	NM	<0.0200

**Notes:**

NM - Indicates parameter was not measured

< - Indicates less than the Method Detection Limit (MDL)

ug/L - Indicates micrograms per liter, equivalent to parts per billion at low concentrations

mg/L - Indicates milligrams per liter, equivalent to parts per million at low concentrations

USEPA HAL - Indicates United States Environmental Protection Agency Health Advisory Level

USEPA NRL - Indicates United States Environmental Protection Agency Negligible Risk Level for Carcinogens

USEPA MCL - Indicates United States Environmental Protection Agency Maximum Contaminant Level

Sampling performed over multiple dates is recorded on the first date sampled. Refer to field forms for exact sample date.

**APPENDIX C**  
**ANALYTICAL DATA**

## ANALYTICAL REPORT

Brian Rath  
BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

TestAmerica Job: 04.14281

Project Number: ANDEX 04101  
Project: AEW-Carter Lake C&D Landfill (October)

Enclosed is the Analytical Reports for the following samples submitted to the Cedar Falls Division of TestAmerica Analytical Testing Corporation for analysis.

Sample Number	Sample Description	Date Taken	Date Received
830067	MW-1	10/04/2004	10/08/2004
830068	MW-3	10/04/2004	10/08/2004
830069	MW-4	10/04/2004	10/08/2004
830070	MW-5	10/04/2004	10/08/2004
830071	MW-6	10/04/2004	10/08/2004
830072	MW-7R	10/04/2004	10/08/2004
830073	MW-8	10/04/2004	10/08/2004

TestAmerica Analytical Testing Corporation certifies that the analytical results contained herein apply only to the specific samples analyzed.

Reproduction of this analytical report is permitted only in its entirety.



Linda Cmelik  
Project Coordinator

## ANALYTICAL REPORT

Brian Rath  
BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Sample No.: 830067

Job No: 04.14281

Sample ID: MW-1  
ANDERSON EXCAVATING-CLOSED CARTER LAKE C&D  
ANDEX 04101

Date Taken:	10/04/2004	Date Received: 10/08/2004						Analysis
		Result	Units	Flags	Quantitation Limit	Date Analyzed	Time Analyzed	
Chloride, FIA	97.2	mg/L			5.0	10/11/2004	12:52	jcf SM 4500-C1 E
COD, LL	53	mg/L			5.0	10/18/2004		mdk SM 5220 D
Ammonia Nitrogen FIA	3.19	mg/L			0.20	10/12/2004	11:35	lbb EPA 350.1
Phenols, Total(FIA)	<0.020	mg/L			0.020	10/21/2004	15:54	jcf EPA 420.2
Total Organic Halogens	0.077	mg/L Cl-			0.010	10/13/2004		sas SW 9020B
Dissolved ICP Metals	COMPLETE					10/13/2004		llw
Iron, Diss (ICP)	17	mg/L			0.10	10/13/2004		llw SW 6010B
Arsenic, Diss (GFAA)	0.0124	mg/L			0.0010	10/15/2004		mrm SW 7060A

Key to Flags:

## ANALYTICAL REPORT

Brian Rath  
BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Sample No.: 830068

Job No: 04.14281

Sample ID: MW-3  
ANDERSON EXCAVATING-CLOSED CARTER LAKE C&D  
ANDEX 04101

Date Taken:	10/04/2004	Date Received: 10/08/2004						Analysis
		Result	Units	Flags	Quantitation Limit	Date Analyzed	Time Analyzed	
Chloride, FIA	169	mg/L			5.0	10/11/2004	12:52	jcf SM 4500-C1 E
COD, LL	31	mg/L			5.0	10/18/2004		mdk SM 5220 D
Ammonia Nitrogen FIA	<0.20	mg/L			0.20	10/12/2004	11:36	lbb EPA 350.1
Phenols, Total(FIA)	<0.020	mg/L			0.020	10/21/2004	15:55	jcf EPA 420.2
Total Organic Halogens	0.032	mg/L Cl <sup>-</sup>			0.010	10/13/2004		sas SW 9020B
Dissolved ICP Metals	COMPLETE					10/13/2004		llw
Iron, Diss (ICP)	0.41	mg/L			0.10	10/13/2004		llw SW 6010B
Arsenic, Diss (GFAA)	0.0027	mg/L			0.0010	10/15/2004		mrm SW 7060A

Key to Flags:

## ANALYTICAL REPORT

Brian Rath  
BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Sample No.: 830069

Job No: 04.14281

Sample ID: MW-4  
ANDERSON EXCAVATING-CLOSED CARTER LAKE C&D  
ANDEX 04101

Date Taken:	10/04/2004	Date Received:		10/08/2004	Quantitation	Date	Time	Analysis	Method
		Result	Units	Flags	Limit	Analyzed	Analyzed	Analyst	
Chloride, FIA	47.0	mg/L			5.0	10/11/2004	12:53	jcf	SM 4500-Cl E
COD, LL	8.1	mg/L			5.0	10/18/2004		mdk	SM 5220 D
Ammonia Nitrogen FIA	2.60	mg/L			0.20	10/12/2004	11:37	lbb	EPA 350.1
Phenols, Total(FIA)	<0.020	mg/L			0.020	10/21/2004	15:55	jcf	EPA 420.2
Total Organic Halogens	0.010	mg/L Cl-			0.010	10/13/2004		sas	SW 9020B
Dissolved ICP Metals	COMPLETE					10/13/2004		llw	
Iron, Diss (ICP)	24	mg/L			0.10	10/13/2004		llw	SW 6010B
Arsenic, Diss (GFAA)	0.0216	mg/L			0.0010	10/15/2004		mrm	SW 7060A

Key to Flags:

## ANALYTICAL REPORT

Brian Rath  
BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Sample No.: 830070

Job No: 04.14281

Sample ID: MW-5  
ANDERSON EXCAVATING-CLOSED CARTER LAKE C&D  
ANDEX 04101

Date Taken:	10/04/2004	Date Received: 10/08/2004						Analysis Method
		Result	Units	Flags	Quantitation Limit	Date Analyzed	Time Analyzed	
Chloride, FIA	52.4	mg/L			5.0	10/11/2004	12:54	jcf SM 4500-C1 E
COD, LL	150	mg/L			5.0	10/18/2004		mdk SM 5220 D
Ammonia Nitrogen FIA	0.49	mg/L			0.20	10/12/2004	12:01	lbb EPA 350.1
Phenols, Total(FIA)	<0.020	mg/L			0.020	10/26/2004		mdk EPA 420.2
Total Organic Halogens	0.094	mg/L Cl-			0.010	10/13/2004		sas SW 9020B
Dissolved ICP Metals	COMPLETE					10/13/2004		llw
Iron, Diss (ICP)	38	mg/L			0.10	10/13/2004		llw SW 6010B
Arsenic, Diss (GFAA)	0.0234	mg/L			0.0010	10/15/2004		mrm SW 7060A

Key to Flags:

## ANALYTICAL REPORT

Brian Rath  
BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Sample No.: 830071

Job No: 04.14281

Sample ID: MW-6  
ANDERSON EXCAVATING-CLOSED CARTER LAKE C&D  
ANDEX 04101

Date Taken:	10/04/2004	Date Received: 10/08/2004						Analysis
		Result	Units	Flags	Quantitation Limit	Date Analyzed	Time Analyzed	
Chloride, FIA	196	mg/L			5.0	10/11/2004	12:54	jcf SM 4500-Cl E
COD, LL	140	mg/L			5.0	10/18/2004		mdk SM 5220 D
Ammonia Nitrogen FIA	6.51	mg/L			0.20	10/12/2004	12:02	lbb EPA 350.1
Phenols, Total(FIA)	<0.020	mg/L			0.020	10/21/2004	15:57	jcf EPA 420.2
Total Organic Halogens	0.012	mg/L Cl-			0.010	10/12/2004		jmh SW 9020B
ICP Metals Prep	D	mg/L	>2			10/13/2004		tdo SW 3010A
Dissolved ICP Metals	COMPLETE					10/15/2004		llw
Iron, Diss (ICP)	31	mg/L			0.10	10/15/2004		llw SW 6010B
Arsenic, Diss (GFAA)	0.0678	mg/L			0.0010	10/14/2004		mrm SW 7060A
GFAA Total Metals Digestio	D		>2			10/13/2004		tdo

## Key to Flags:

&gt;2 - Sample received at pH&gt;2. It was adjusted correctly prior to analysis.

## ANALYTICAL REPORT

Brian Rath  
BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Sample No.: 830072

Job No: 04.14281

Sample ID: MW-7R  
ANDERSON EXCAVATING-CLOSED CARTER LAKE C&D  
ANDEX 04101

Date Taken:	10/04/2004	Date Received: 10/08/2004						Analysis Method
		Result	Units	Flags	Quantitation Limit	Date Analyzed	Time Analyzed	
Chloride, FIA	48.9	mg/L			5.0	10/11/2004	12:55	jcf SM 4500-C1 E
COD, LL	69	mg/L			5.0	10/18/2004		mdk SM 5220 D
Ammonia Nitrogen FIA	2.64	mg/L			0.20	10/12/2004	12:02	lbb EPA 350.1
Phenols, Total(FIA)	<0.020	mg/L			0.020	10/21/2004	16:01	jcf EPA 420.2
Total Organic Halogens	0.021	mg/L Cl-			0.010	10/12/2004		jmh SW 9020B
ICP Metals Prep	D	mg/L	>2			10/13/2004		tdo SW 3010A
Dissolved ICP Metals	COMPLETE					10/15/2004		llw SW 6010B
Iron, Diss (ICP)	32	mg/L			0.10	10/15/2004		llw SW 7060A
Arsenic, Diss (GFAA)	0.0204	mg/L			0.0010	10/14/2004		mrm
GFAA Total Metals Digestio	D		>2			10/13/2004		tdo

## Key to Flags:

&gt;2 - Sample received at pH&gt;2. It was adjusted correctly prior to analysis.

## ANALYTICAL REPORT

Brian Rath  
BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Sample No.: 830073

Job No: 04.14281

Sample ID: MW-8  
ANDERSON EXCAVATING-CLOSED CARTER LAKE C&D  
ANDEX 04101

Date Taken:	10/04/2004	Date Received: 10/08/2004						Analysis	Method
		Result	Units	Flags	Quantitation Limit	Date Analyzed	Time Analyzed		
Chloride, FIA	88.2	mg/L			5.0	10/11/2004	12:55	jcf	SM 4500-Cl E
COD, LL	18	mg/L			5.0	10/18/2004		mdk	SM 5220 D
Ammonia Nitrogen FIA	2.30	mg/L			0.20	10/12/2004	12:04	lbb	EPA 350.1
Phenols, Total(FIA)	<0.020	mg/L			0.020	10/21/2004	16:02	jcf	EPA 420.2
Total Organic Halogens	0.039	mg/L Cl-			0.010	10/13/2004		sas	SW 9020B
Dissolved ICP Metals	COMPLETE					10/13/2004		llw	
Iron, Diss (ICP)	40	mg/L			0.10	10/13/2004		llw	SW 6010B
Arsenic, Diss (GFAA)	0.0170	mg/L			0.0010	10/15/2004		mrm	SW 7060A

Key to Flags:

## QUALITY CONTROL REPORT

BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Job Number: 04.14281

Brian Rath

Enclosed is the Quality Control data for the following samples submitted to TestAmerica, Inc. - Cedar Falls for analysis:

Sample Number	Sample Description	Date Taken	Date Received
830067	MW-1	10/04/2004	10/08/2004
830068	MW-3	10/04/2004	10/08/2004
830069	MW-4	10/04/2004	10/08/2004
830070	MW-5	10/04/2004	10/08/2004
830071	MW-6	10/04/2004	10/08/2004
830072	MW-7R	10/04/2004	10/08/2004
830073	MW-8	10/04/2004	10/08/2004

This Quality Control report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

## QUALITY CONTROL REPORT BLANKS

BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Brian Rath

Job Number: 04.14281

Analyte	Prep	Run		Blank Analysis	Units	Date Analyzed	Analyst
	Batch Number	Batch Number	Date				
Chloride, FIA		1092	<5.0	mg/L	10/11/2004	jcf	
COD, LL		700	<5.0	mg/L	10/18/2004	mdk	
Ammonia Nitrogen FIA		590	<0.20	mg/L	10/12/2004	lbb	
Ammonia Nitrogen FIA		591	<0.20	mg/L	10/12/2004	lbb	
Phenols, Total(FIA)		1486	<0.020	mg/L	10/21/2004	jcf	
Phenols, Total(FIA)		1491	<0.020	mg/L	10/26/2004	mdk	
Total Organic Halogens		1339	<0.010	mg/L	10/12/2004	sas	
Total Organic Halogens		1339	<0.010	mg/L	10/13/2004	sas	
Total Organic Halogens		1339	<0.010	mg/L	10/14/2004	sas	
Dissolved ICP Metals		1711	COMPLETE		10/13/2004	llw	
Iron, Diss (ICP)		1668	<0.10	mg/L	10/13/2004	llw	
Iron, Diss (ICP)		1672	<0.10	mg/L	10/15/2004	llw	
Arsenic, Diss (GFAA)		1032	<0.0010	mg/L	10/14/2004	mrm	
Arsenic, Diss (GFAA)		1035	<0.0010	mg/L	10/15/2004	mrm	

NA - Not Applicable

Advisory Control Limits for Blanks:

All compounds should be less than the quantitation limit.

## QUALITY CONTROL REPORT STANDARDS

BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Brian Rath

Job Number: 04.14281

Analyte	Prep	Run	CCV	LCS	% Recovery	% Recovery	Analyst
	Batch	Batch					
Chloride, FIA		1092	101.6				
Chloride, FIA		1092	101.2				
Chloride, FIA		1092	101.4				
Chloride, FIA		1092	95.5				
Chloride, FIA		1092	95.0				
Chloride, FIA		1092	94.5				
COD, LL		700	99.2				
COD, LL		700	96.4				
COD, LL		700	102.2				
COD, LL		700	101.6				
Ammonia Nitrogen FIA		590	106.6				
Ammonia Nitrogen FIA		590	107.8				
Ammonia Nitrogen FIA		590	107.6				
Ammonia Nitrogen FIA		590	105.4				
Ammonia Nitrogen FIA		590	103.3				
Ammonia Nitrogen FIA		590	104.7				
Ammonia Nitrogen FIA		590	106.0				
Ammonia Nitrogen FIA		590	106.7				
Ammonia Nitrogen FIA		591	90.6				
Ammonia Nitrogen FIA		591	102.0				
Ammonia Nitrogen FIA		591	107.3				
Ammonia Nitrogen FIA		591	106.0				
Phenols, Total(FIA)		1486	101.0	97.0		jcf	
Phenols, Total(FIA)		1486	101.0				
Phenols, Total(FIA)		1486	100.0				
Phenols, Total(FIA)		1486	103.4				
Phenols, Total(FIA)		1486	102.2				
Phenols, Total(FIA)		1486	100.8				
Phenols, Total(FIA)		1491	98.0	99.4		mdk	
Phenols, Total(FIA)		1491	97.0				
Phenols, Total(FIA)		1491	103.2				

CCV - Continuing Calibration Verification

LCS - Laboratory Control Standard

NA - Not Applicable

## QUALITY CONTROL REPORT STANDARDS

BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Brian Rath

Job Number: 04.14281

Analyte	Prep	Run	CCV	LCS	Analyst
	Batch	Batch			
Phenols, Total(FIA)		1491	102.0		
Total Organic Halogens		1339	107.2	94.1	sas
Total Organic Halogens		1339	104.2		
Total Organic Halogens		1339	96.4		
Dissolved ICP Metals		1711	100.0		
Dissolved ICP Metals				100.0	llw
Iron, Diss (ICP)		1668	105.4		
Iron, Diss (ICP)		1668	106.0		
Iron, Diss (ICP)		1672	98.2	95.0	llw
Arsenic, Diss (GFAA)		1032	107.1	95.8	mrm
Arsenic, Diss (GFAA)		1035	104.9		
Arsenic, Diss (GFAA)		1035	109.8		

CCV - Continuing Calibration Verification

LCS - Laboratory Control Standard

NA - Not Applicable

## QUALITY CONTROL REPORT MATRIX SPIKE

Brian Rath  
BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Job Number: 04.14281

Analyte	Prep	Run	Conc.		Conc.	MS	Date	
	Batch	Batch	Spike	Sample	MS	%		
	No.	No.	Added	Units	Result	Rec.	Flag	Analyzed
Dissolved ICP Metals		1711	1.0		COMPLETE		10/13/2004	
Iron, Diss (ICP)		1668	1.92	mg/L	<0.10	1.97	103	10/13/2004
Iron, Diss (ICP)		1668	1.92	mg/L	<0.10	2.00	104	10/13/2004
Arsenic, Diss (GFAA)		1035	0.0227	mg/L	<0.0010	0.0240	106	10/15/2004
Arsenic, Diss (GFAA)		1035	0.0227	mg/L	0.0170	0.0353	81	10/15/2004

## QUALITY CONTROL REPORT DUPLICATES

Brian Rath  
BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Job Number: 04.14281

Analyte	Prep	Run	Duplicate				RPD	Date	Max.			
	Batch	Batch	Sample	Sample	Units	Flag						
	No.	No.	Result	Result								
Phenols, Total (FIA)		1491	0.031	0.055	mg/L	55.8	MSO	10/26/2004	20			
Dissolved ICP Metals		1711	COMPLETE	COMPLETE				10/13/2004	20			
Iron, Diss (ICP)		1668	<0.10	<0.10	mg/L			10/13/2004	20			
Iron, Diss (ICP)		1668	<0.10	<0.10	mg/L			10/13/2004	20			
Arsenic, Diss (GFAA)		1035	<0.0010	<0.0010	mg/L			10/15/2004	20			
Arsenic, Diss (GFAA)		1035	0.0234	0.0230	mg/L	1.7		10/15/2004	20			

MSO - MS and/or MSD recoveries are outside of control limits

[www.testamericainc.com](http://www.testamericainc.com)

TestAmerica Analytical Testing Corporation | TestAmerica Drilling Corporation | TestAmerica Air Emission Corporation

## QUALITY CONTROL REPORT MATRIX SPIKE/MATRIX SPIKE DUPLICATE

BARKER, LEMAR & ASSOCIATES  
1801 Industrial Circle  
West Des Moines, IA 50265

10/27/2004

Brian Rath

Job Number: 04.14281

Analyte	Prep	Run			MS	MS	MSD	MSD	MS/MSD
	Batch	Batch	Analysis	Units					
Chloride, FIA		1092	37.4	mg/L	60.3	91.6	60.3	91.6	0.0
COD, LL		700	<5.0	mg/L	44.1	88.2	42.4	84.8	3.9
Ammonia Nitrogen FIA		590	<0.20	mg/L	10.2	102.0	10.4	104.0	1.9
Ammonia Nitrogen FIA		591	2.30	mg/L	12.3	100.0	12.4	101.0	0.8
Phenols, Total(FIA)		1486	<0.020	mg/L	0.097	97.0	0.098	98.0	1.0
Phenols, Total(FIA)		1491	<0.020	mg/L	0.2757	172.3			
Total Organic Halogens		1339	0.032	mg/L C	0.14232	110.3	0.15257	120.6	7.0
Dissolved ICP Metals		1715	COMPLETE						
Iron, Diss (ICP)		1672	0.16	mg/L	2.16	100.0	2.27	105.5	5.0
Arsenic, Diss (GFAA)		1032	0.0054	mg/L	0.0502	112.0	0.0490	109.0	2.4

NOTE: Matrix Spike Samples may not be samples from this job.

NA = Not Applicable

MS = Matrix Spike

MSD = Matrix Spike Duplicate

RPD = Relative Percent Difference

[www.testamericainc.com](http://www.testamericainc.com)

TestAmerica Job Number: 04.14281

#### ATTACHMENTS

Following are the sample receipt log and the chain of custody applicable to this analytical report.

Any abnormalities or departures from sample acceptance policy shall be documented on the "Sample Receipt and Temperature Log Form" and Sample Non-Conformance Form" (if applicable) included with this report.

For information concerning certifications of this facility or another TestAmerica facility please visit our website at [www.TestAmericaInc.com](http://www.TestAmericaInc.com).

This data has been produced in compliance with 2002 NELAC Standards (July 2004), except where noted.

Samples collected by TestAmerica Field Services personnel are noted on the Chain of Custody (COC) and are sampled in accordance with TA-CF SOP CF09-01.

This report shall not be reproduced, except in full, without written approval of the laboratory.

*For questions regarding this report, please contact the individual who signed the analytical report.*

Test America

Biomonitoring

704 Enterprise Drive  
Cedar Falls, Iowa 50613

SAMPLER, Barker Lemar Engineering Consultants

SITE NAME: Anderson Excavating & Wrecking, Closed Carter Lake C&D Landfill (October)

**ADDRESS:** 1801 Industrial Circle

CITY/STATE/ZIP: West Des Moines, IA 50265

TELEPHONE NUMBER: 515-256-8814

Fax: 515-256-0152

SAMPLED BY: (PRINT NAME)

Joe Herricks  
Joe Herricks

**SIGNATURE:**

**Phone:** 319-277-2401  
**Fax:** 515-792-7989

or 1-800-750-2401

**REPORT TO:**

Brian Rath

COMPANY NAME:

---

Barker Lemar Engineering Consultants

**PROJECT NAME:**

**Anderson Excavating & Wrecking, Closed Carter Lake C&D Landfill (October)**

PROJECT NUMBER: ANDEX 04101

1801 Industrial Circle

**CITY/STATE/ZIP:**

**West Des Moines, IA 50265**

**LABORATORY WORK ORDER NO.**

Sample ID	LABORATORY WORK ORDER NO.										Standard TAT	Fax Results	LABORATORY SAMPLE NUMBER									
	Date Sampled	Time Sampled	# of Containers Shipped	Grab	Composite	Field Filtered	Preservative	Matrix	Analyze For:													
VW-1	10-4	2:45	5	6		X X	HNO <sub>3</sub> (Red & White Label)															
MW-3	10-4	3:35				X X	HCl (Blue & White Label)															
MW-4	10-4	3:55				X X	NaOH (Orange & White Label)															
MW-5	10-4	4:30				X X	H <sub>2</sub> SO <sub>4</sub> , Plastic (Yellow & White Label)															
MW-6	10-4	4:45				X X	H <sub>2</sub> SO <sub>4</sub> , Glass (Yellow & White Label)															
MW-7R	10-4	5:10				X X	None (Black & White Label)															
MW-8	10-4	3:05				X X	Other (Specify): _____															
<del>-----</del>						X	Groundwater															
						X	Wastewater															
						X	Drinking Water															
						X	Sludge															
						X	Soil															
						X	Other (Specify): _____															
						X	"d" list															
						X	"e" list															
						X	"f" list															
						X	Arsenic															
<i>John Hines</i>	Date: 10-8-04	Time:	Received by:											Date:	Time:	Relinquished by					Date	Time
Shipped Via:	Comments:										Shipped Via:											
Received for Lab by:	Date: 10-8-04	Time: 19:00	Temperature Upon Receipt:										Laboratory Comments:									

# TestAmerica

ANALYTICAL TESTING CORPORATION

704 ENTERPRISE DRIVE • CEDAR FALLS, IA 50613 • 800-750-2401 • 319-277-2425 FAX

## Sample Receipt and Temperature Log Form

Client: BARKER LEASE

Project: Anderson Excavating  
& Wrecking

City: WEST DES MOINES

Date: 10-8-04 Receiver's Initials MW

Time (Delivered): 19:00

### Temperature Record

Cooler ID# (If Applicable)

ARRAY 1

2 °C / On Ice

Temp Blank

Temperature out of compliance

Custody seals present?

Yes

Custody seals intact?

Yes  No

Non-Conformance report started

### Thermometer:

IR - 905085 "A"

IR - 809065 "B"

CF07-03-T2

22126775

### Courier:

Airborne

Speedy

UPS

TA Courier

Velocity

TA Field Svcs

FedEx

Client

DHL

Other

US Postal

### Exceptions Noted

Sample(s) not received in a cooler.

Samples(s) received same day of sampling.

Temperature not taken:  
\_\_\_\_\_

10-11-04 Det Joe H, go with ID on COC for MWR.  
MWR was marked on all the bottles.

Log-In by:

JP MF EM

OT \_\_\_\_\_

\*Refer to SOP CF01-01 for Temperature Criteria

# TestAmerica

ANALYTICAL TESTING CORPORATION

704 ENTERPRISE DRIVE • CEDAR FALLS, IA 50613 • 800-750-2401 • 319-277-2425 FAX

## Sample Receipt and Temperature Log Form

Client: Barker Lemer

Project: Anderson Excavating  
& Wrecking

City: WEST DES MOINES

Date: 10-8-04 Receiver's Initials MW

Time (Delivered): 19:00

### Temperature Record

Cooler ID# (If Applicable)

BBU - 51

2 °C / On Ice

Temp Blank

Temperature out of compliance

Custody seals present?

Yes

Custody seals intact?

Yes  No

Non-Conformance report started

### Thermometer:

- IR - 905085 "A"
- IR - 809065 "B"
- CF07-03-T2
- 22126775

### Courier:

- |                                    |  |
|------------------------------------|--|
| <input type="checkbox"/> Airborne  | <input type="checkbox"/> Speedy                |
| <input type="checkbox"/> UPS       | <input checked="" type="checkbox"/> TA Courier |
| <input type="checkbox"/> Velocity  | <input type="checkbox"/> TA Field Svcs         |
| <input type="checkbox"/> FedEx     | <input type="checkbox"/> Client                |
| <input type="checkbox"/> DHL       |  |
| <input type="checkbox"/> US Postal | <input type="checkbox"/> Other                 |

### Exceptions Noted

- |                          |   |
|--------------------------|---|
| <input type="checkbox"/> | Sample(s) not received in a cooler.       |
| <input type="checkbox"/> | Samples(s) received same day of sampling. |
| <input type="checkbox"/> | Temperature not taken:<br>_____           |

Log-In by:

JP MF EM  
OT \_\_\_\_\_

\*Refer to SOP CF01-01 for Temperature Criteria

**APPENDIX D**  
**EXCEEDANCE TABLE**

**Summary of Statistical Exceedances  
Groundwater Monitoring Wells  
by Well Cluster**

Page 1 of 1

**Carter Lake Construction and Demolition Landfill - 78-SDP-02-80**

**MW-3 - Cluster DN1**

**Chloride**

**Mean:** 79.8      **STD:** 31.8      **Exceedances Level:** 143.41

**Current Action Levels**      **None Established**

10/4/2004      169 mg/L

**MW-5 - Cluster DN1**

**Chemical Oxygen Demand**

**Mean:** 100.1      **STD:** 16.6      **Exceedances Level:** 133.20

**Current Action Levels**      **None Established**

10/4/2004      150 mg/L

**Iron, Dissolved**

**Mean:** 15.23      **STD:** 8.34      **Exceedances Level:** 31.90

**Current Action Levels**      **None Established**

10/4/2004      38 mg/L

**Total Organic Halogens**

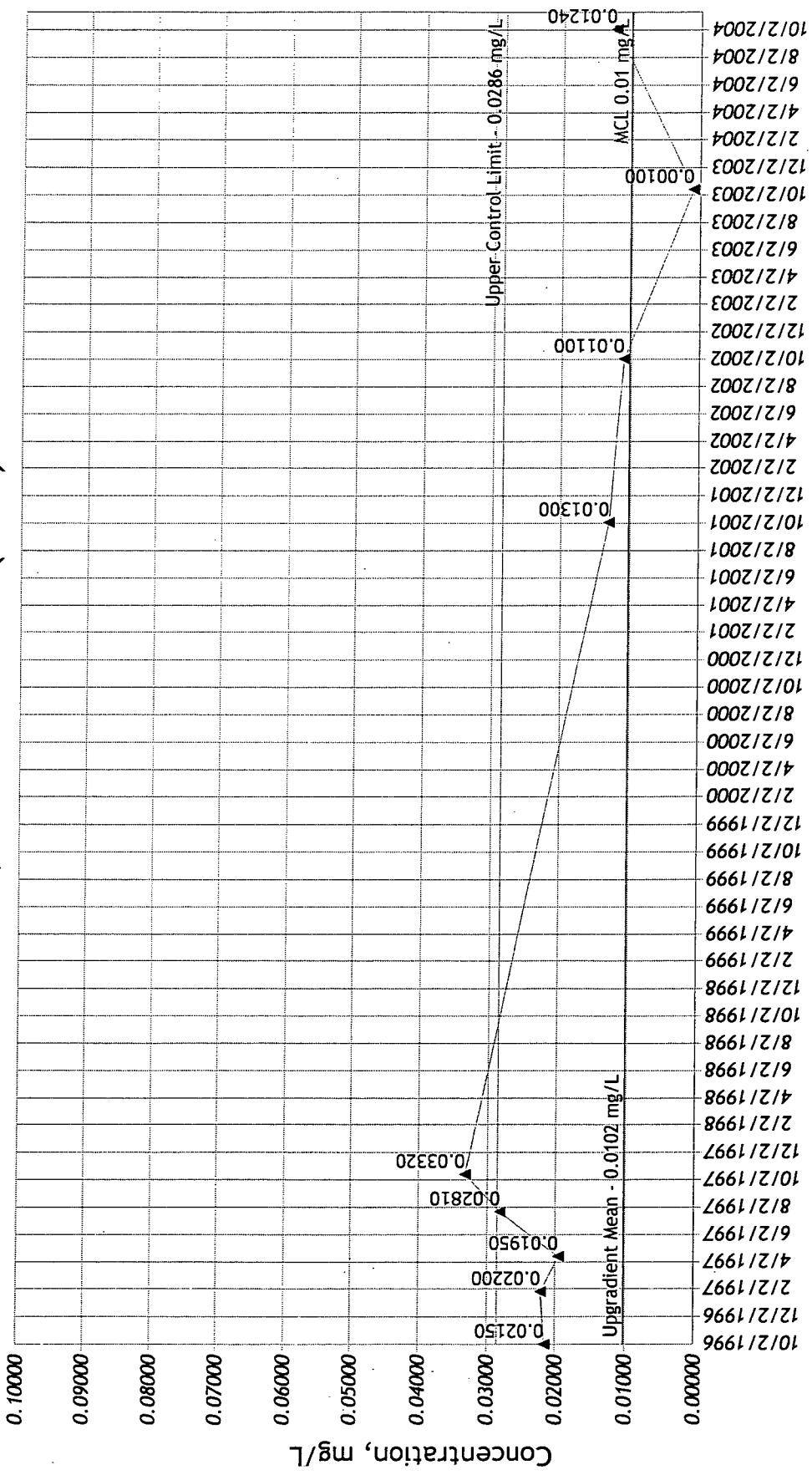
**Mean:** 0.0351      **STD:** 0.0240      **Exceedances Level:** 0.08316

**Current Action Levels**      **None Established**

10/4/2004      0.094 mg/L

**APPENDIX E**  
**GRAPHS OF ANALYTICAL**  
**PARAMETERS/MONITORING POINTS**

### Arsenic, Dissolved Trends - (MW-1)



**Arsenic, Dissolved  
Carter Lake Construction and Demolition Landfill**  
78-SDP-02-80

**1**

04001  
11/10/2004 12:00:34 PM

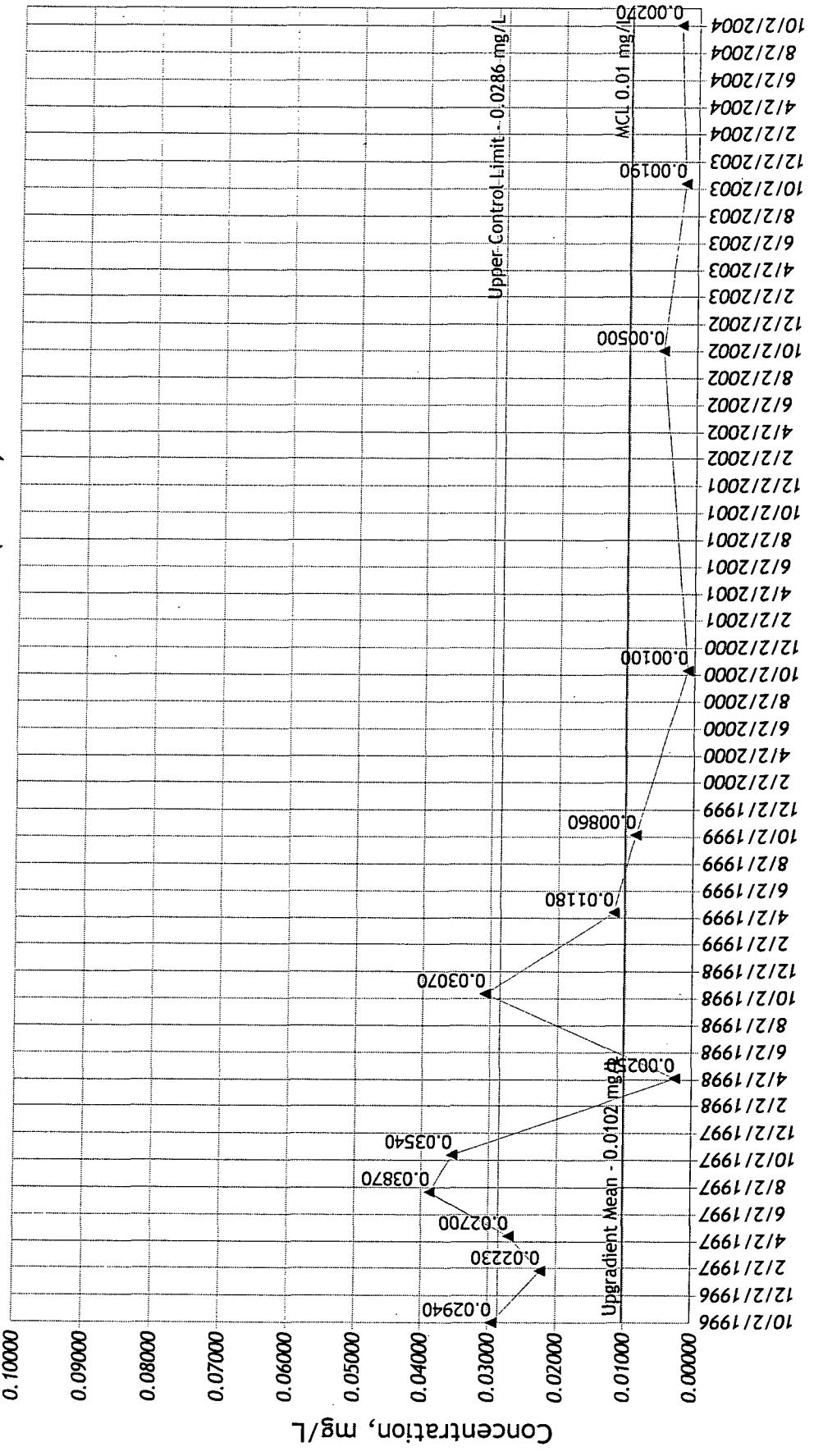
**2**

Arsenic, Dissolved  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

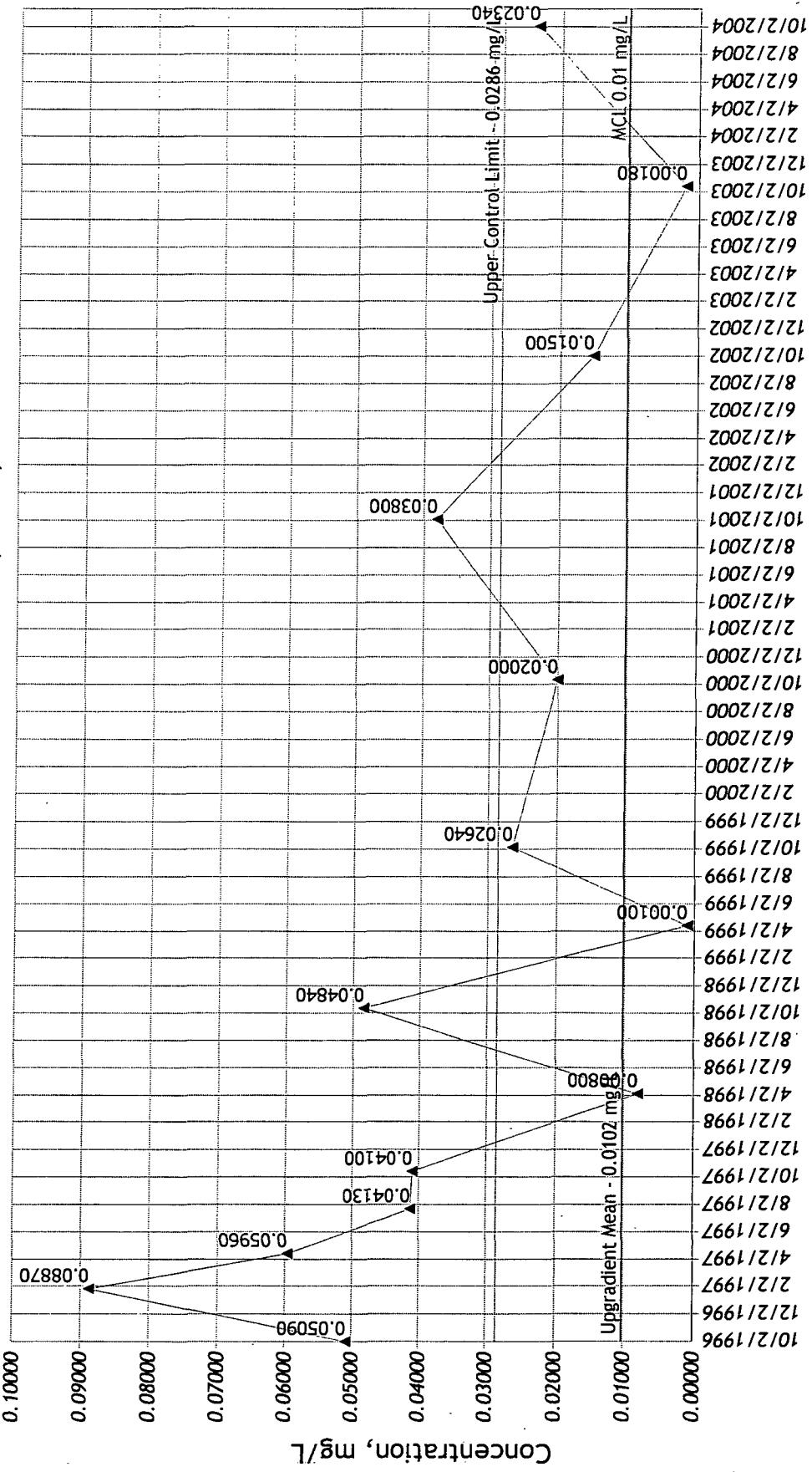
04001  
11/10/2004 12:00:35 PM

Date Measured

Arsenic, Dissolved Trends - (MW-3)



### Arsenic, Dissolved Trends - (MW-5)



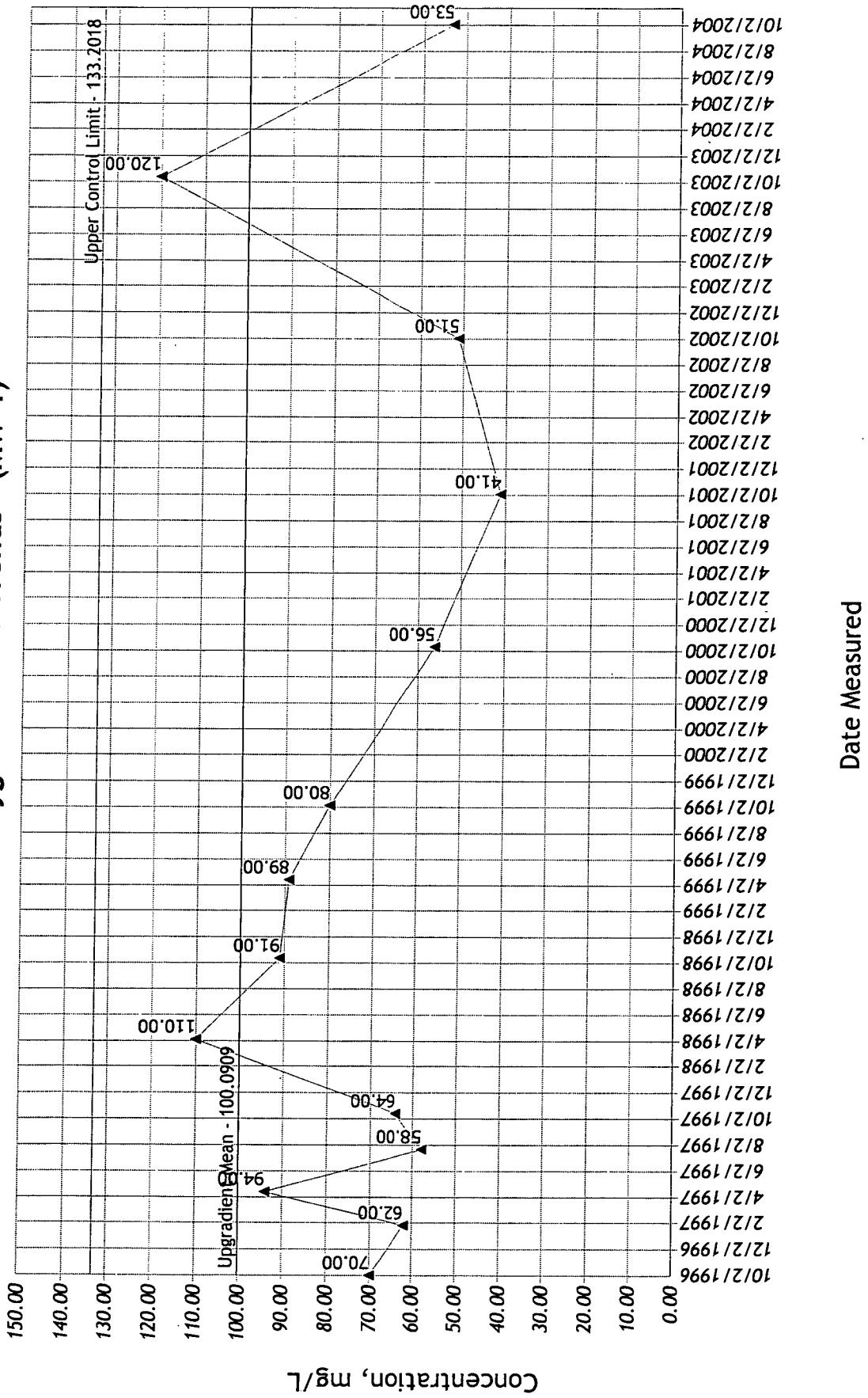
**Arsenic, Dissolved  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80**

**3**

04001

11/10/2004 12:00:36 PM

### Chemical Oxygen Demand Trends - (MW-1)



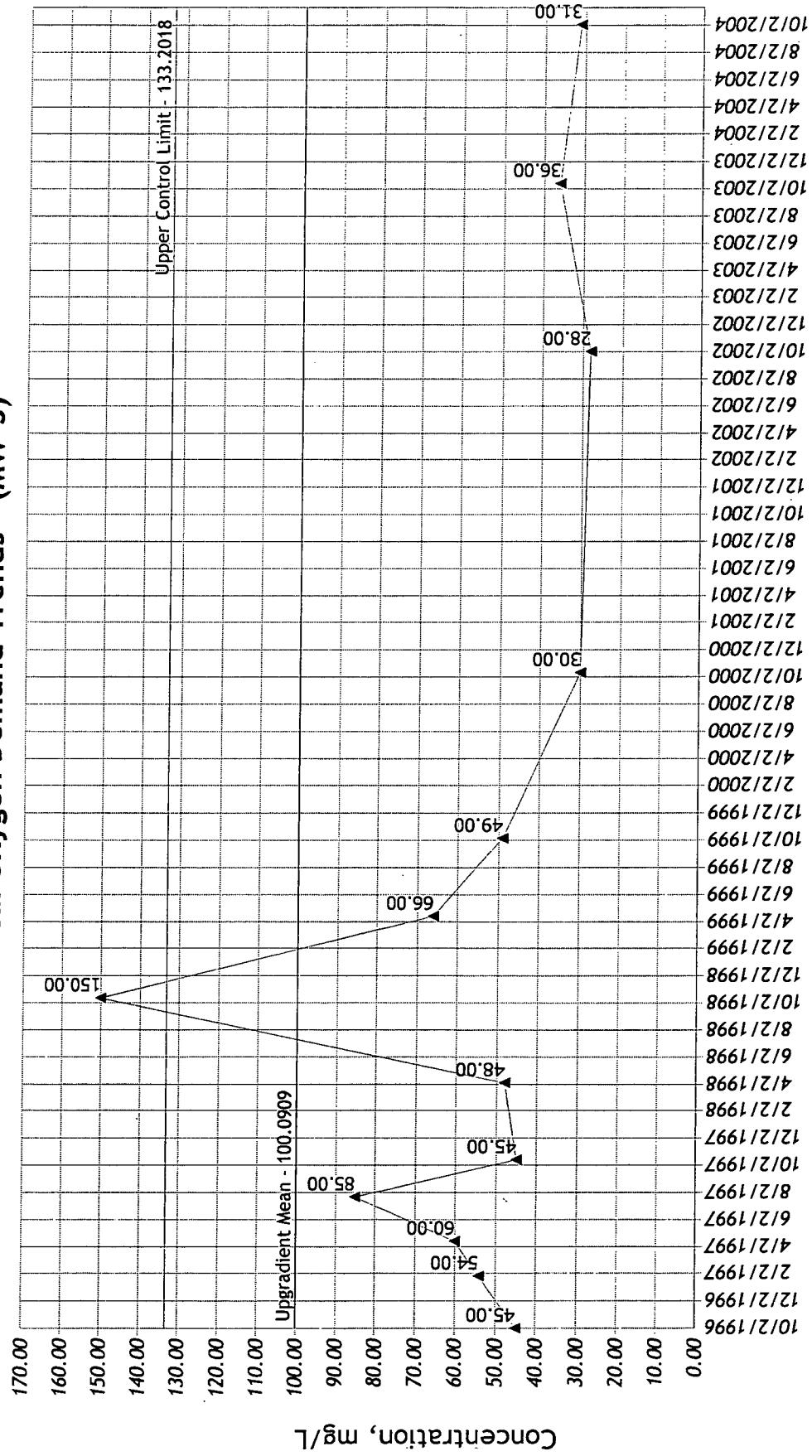
4

Chemical Oxygen Demand  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

04001

11/10/2004 12:00:37 PM

### Chemical Oxygen Demand Trends - (MW-3)



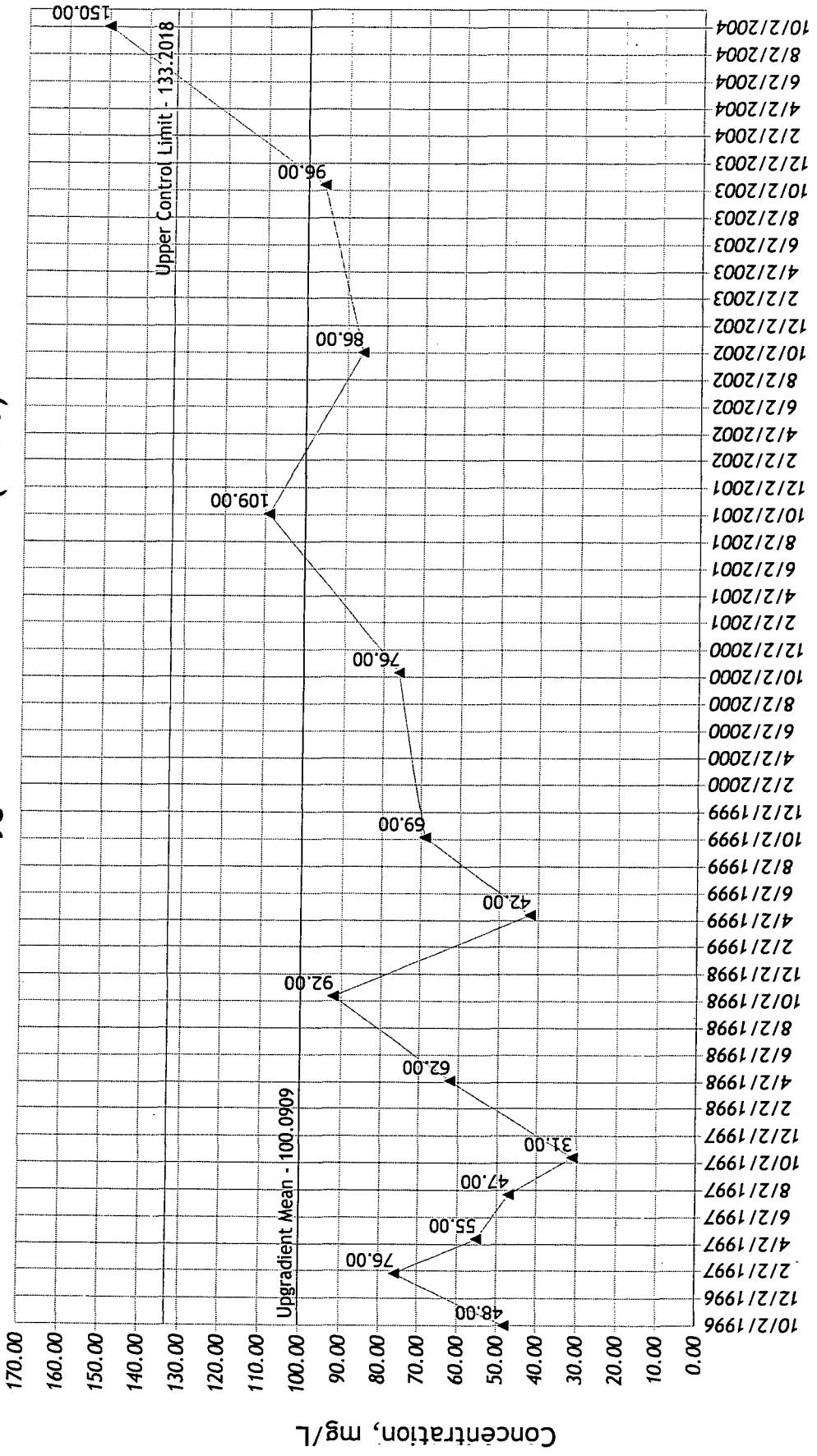
Chemical Oxygen Demand  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

5

04001

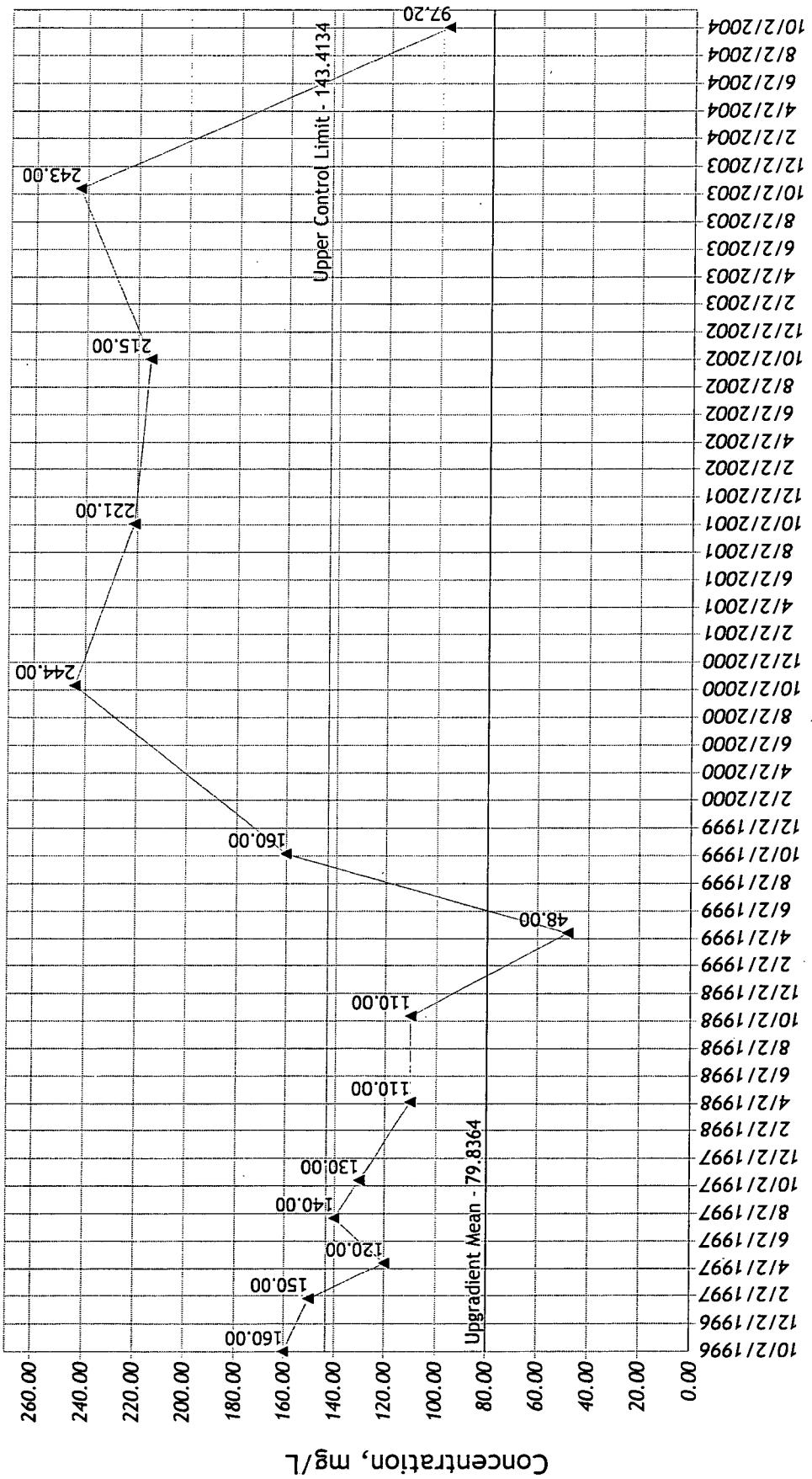
11/10/2004 12:00:37 PM

## Chemical Oxygen Demand Trends - (MW-5)



Chemical Oxygen Demand  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

## Chloride Trends - (MW-1)



**Chloride**  
**Carter Lake Construction and Demolition Landfill**  
78-SDP-02-80

7

04001

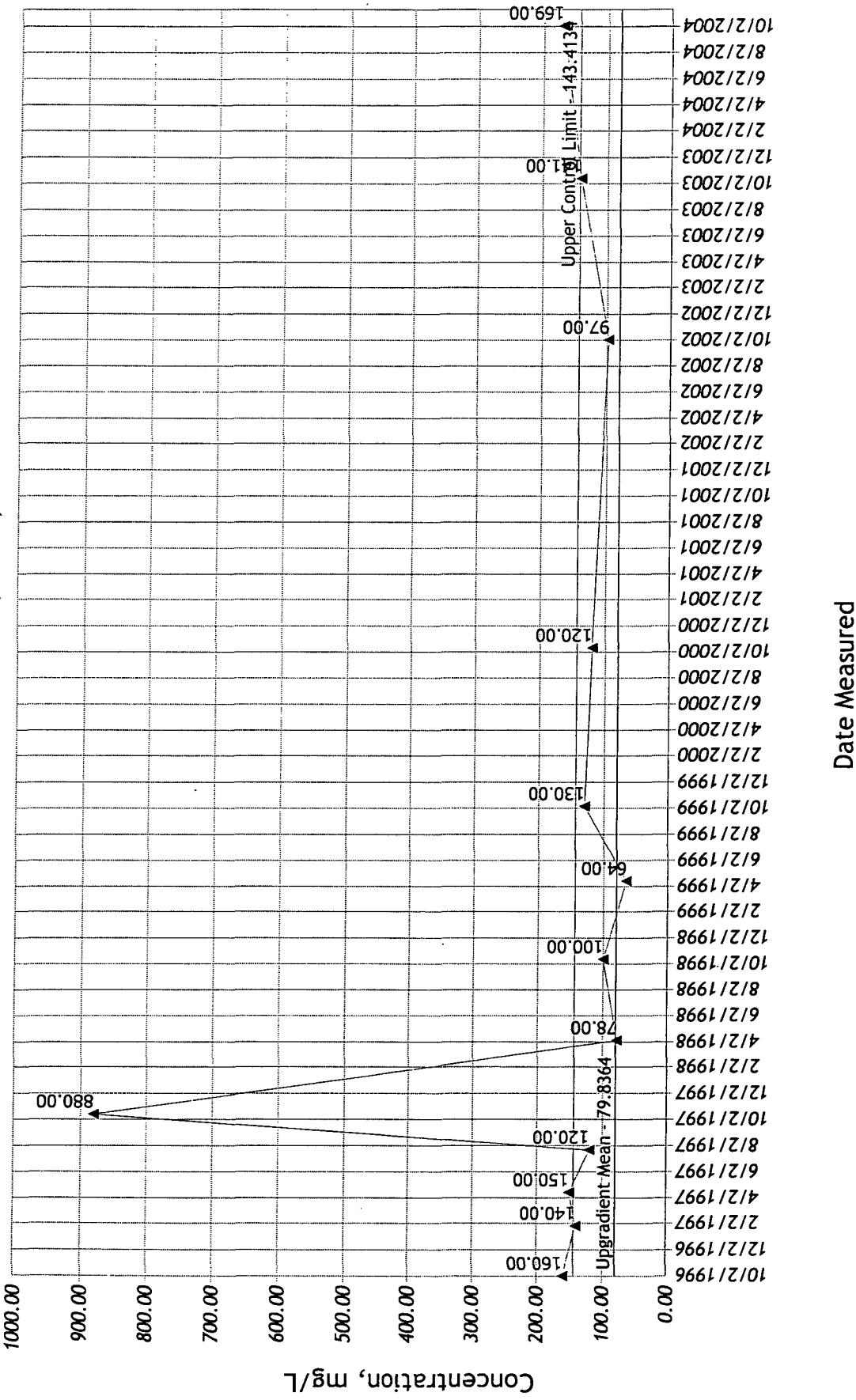
11/10/2004 12:00:38 PM

**Chloride**  
**Carter Lake Construction and Demolition Landfill**  
 78-SDP-02-80

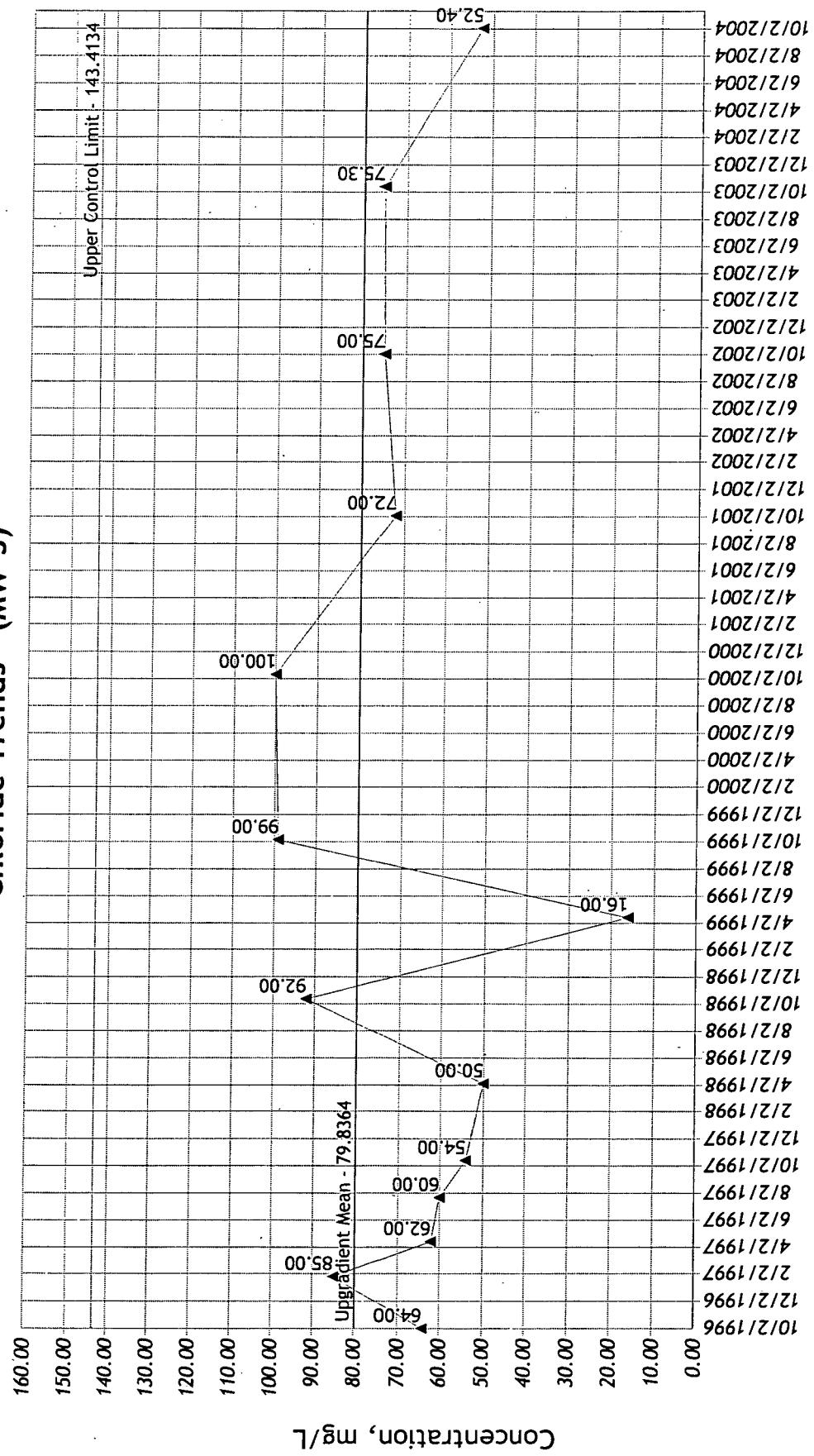
**8**

04001  
 11/10/2004 12:00:39 PM

**Chloride Trends - (MW-3)**

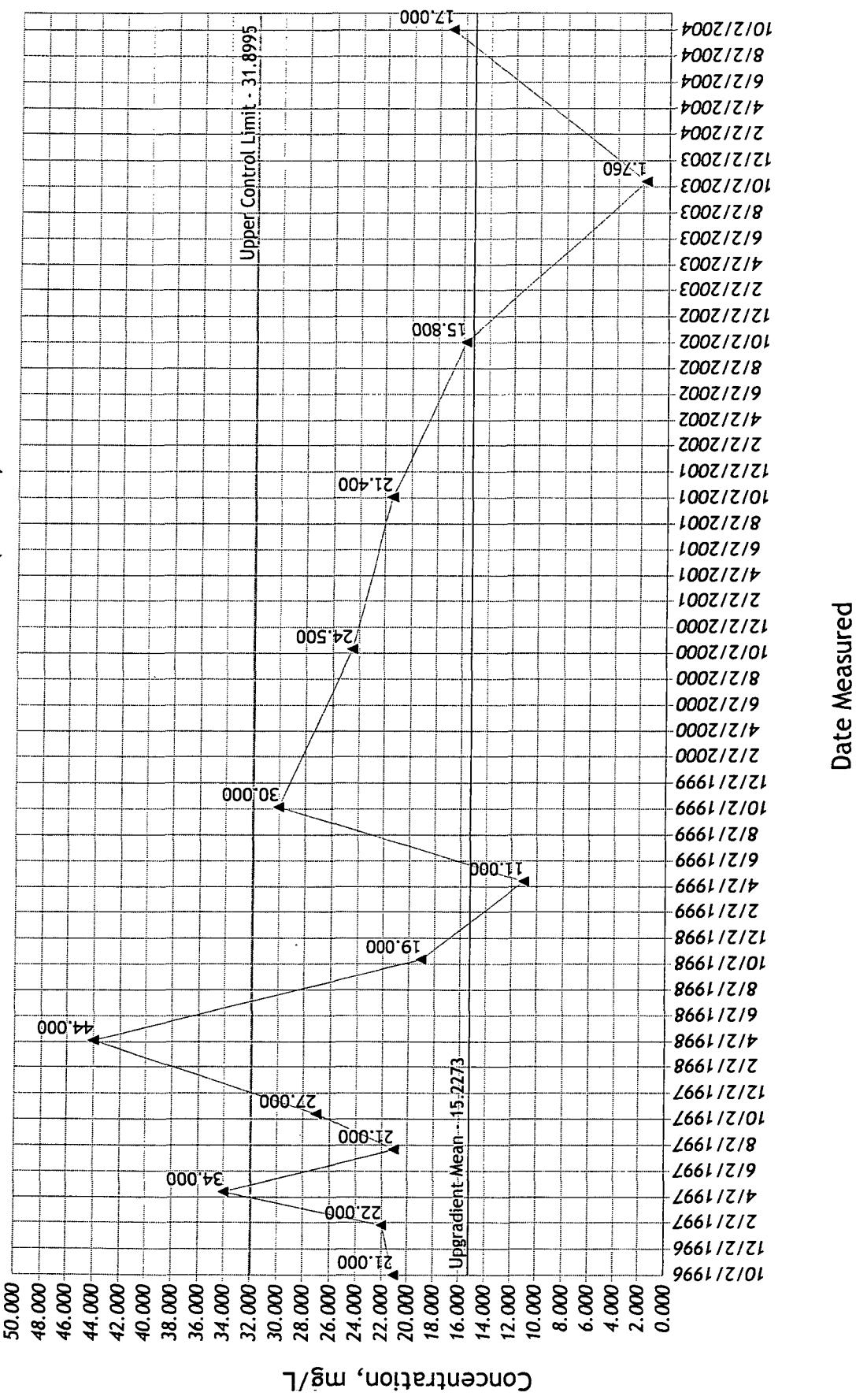


## Chloride Trends - (MW-5)



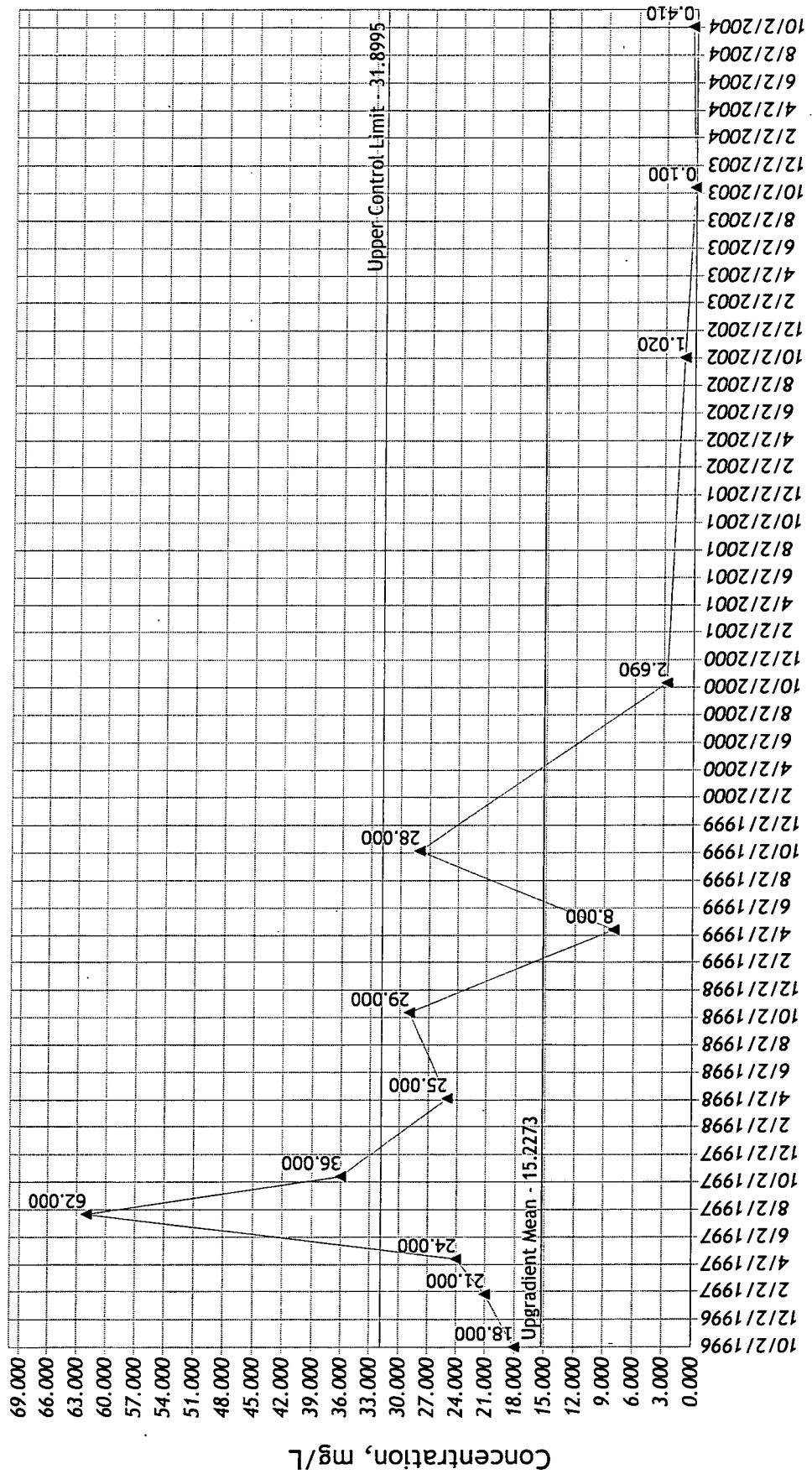
Chloride  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

## Iron, Dissolved Trends - (MW-1)



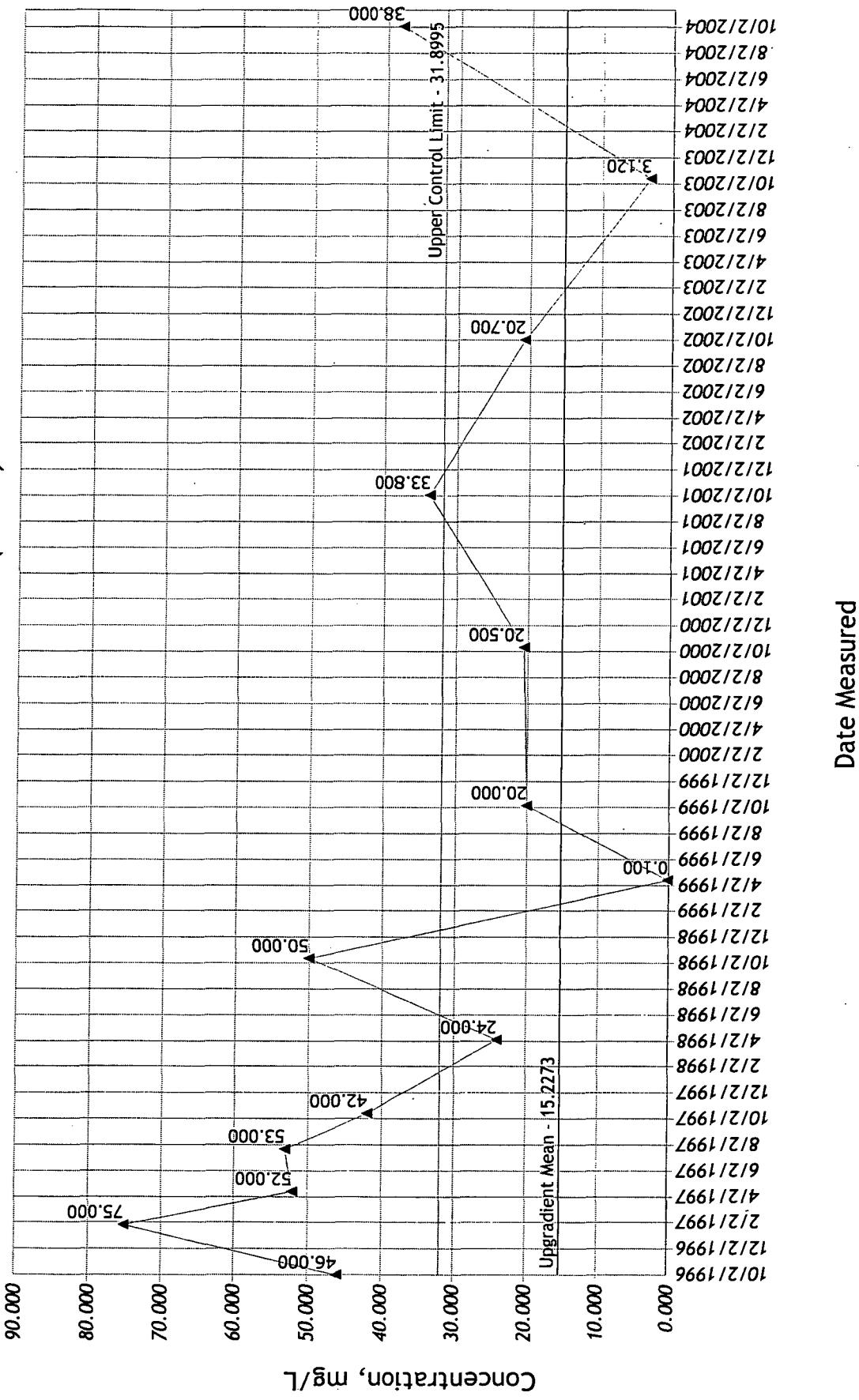
Iron, Dissolved  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

### Iron, Dissolved Trends - (MW-3)



**Iron, Dissolved**  
**Carter Lake Construction and Demolition Landfill**  
78-SDP-02-80

## Iron, Dissolved Trends - (MW-5)



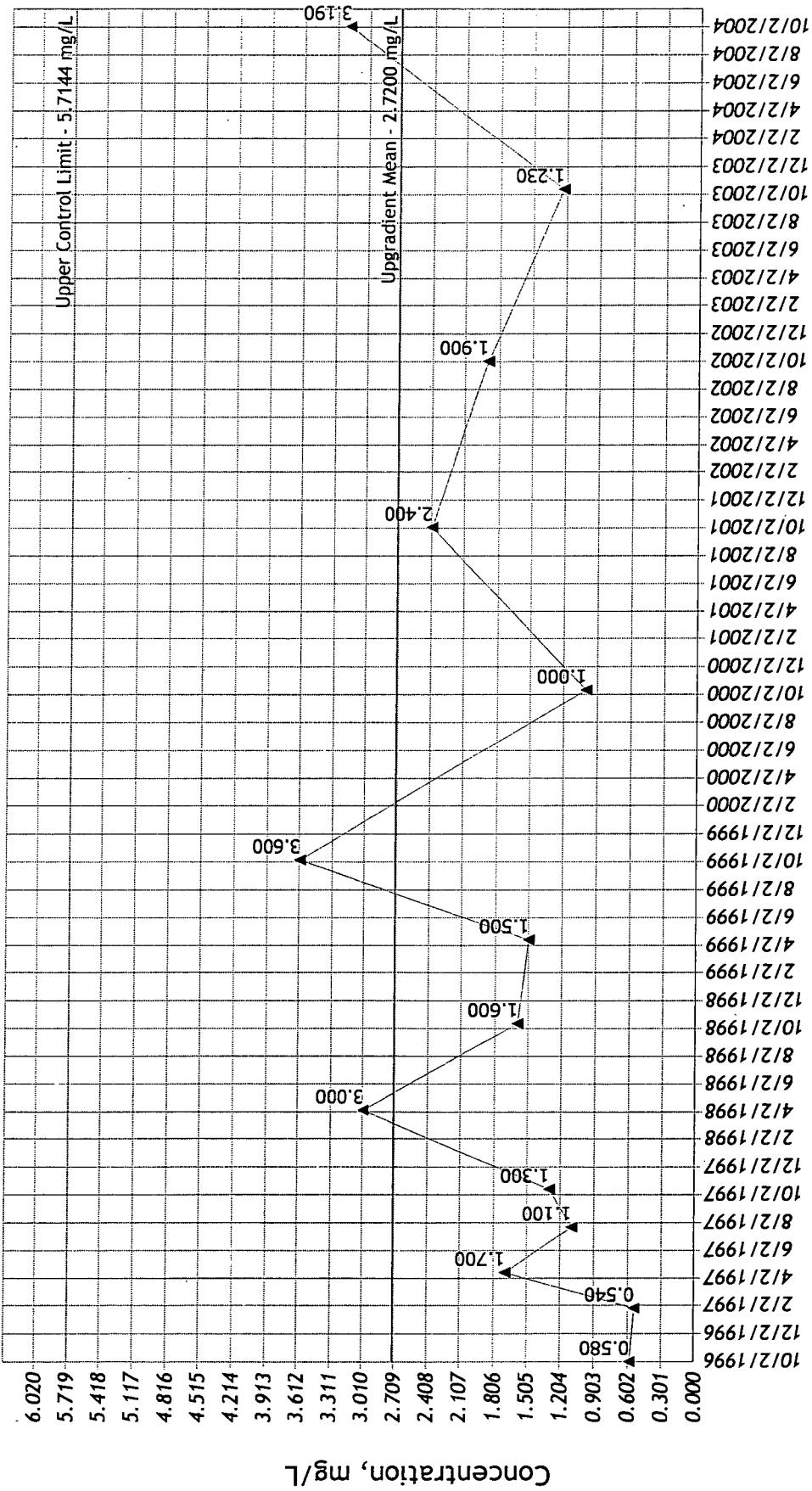
**12**

**Iron, Dissolved  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80**

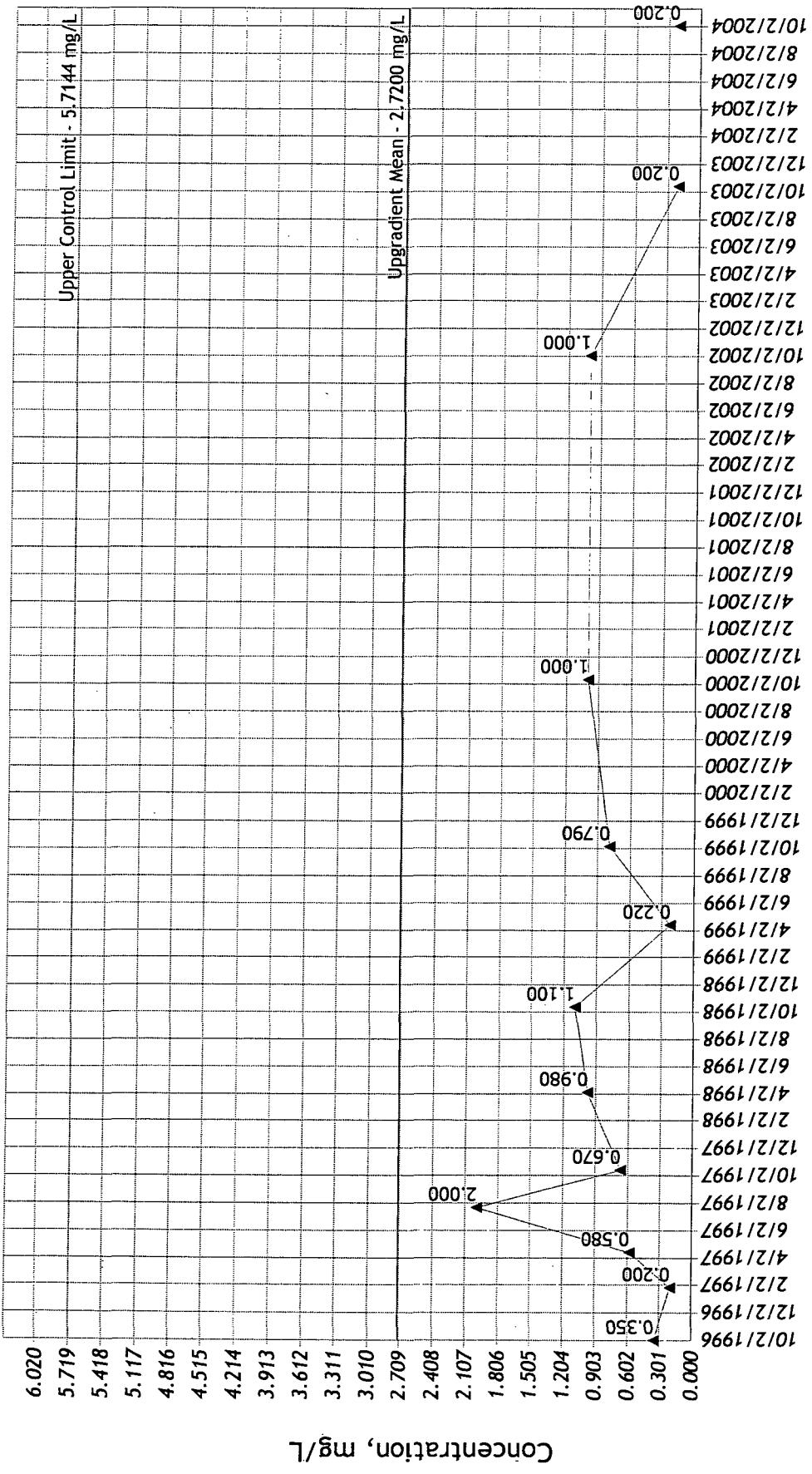
04001

11/10/2004 12:00:41 PM

## Nitrogen, Ammonia Trends - (MW-1)



## Nitrogen, Ammonia Trends - (MW-3)

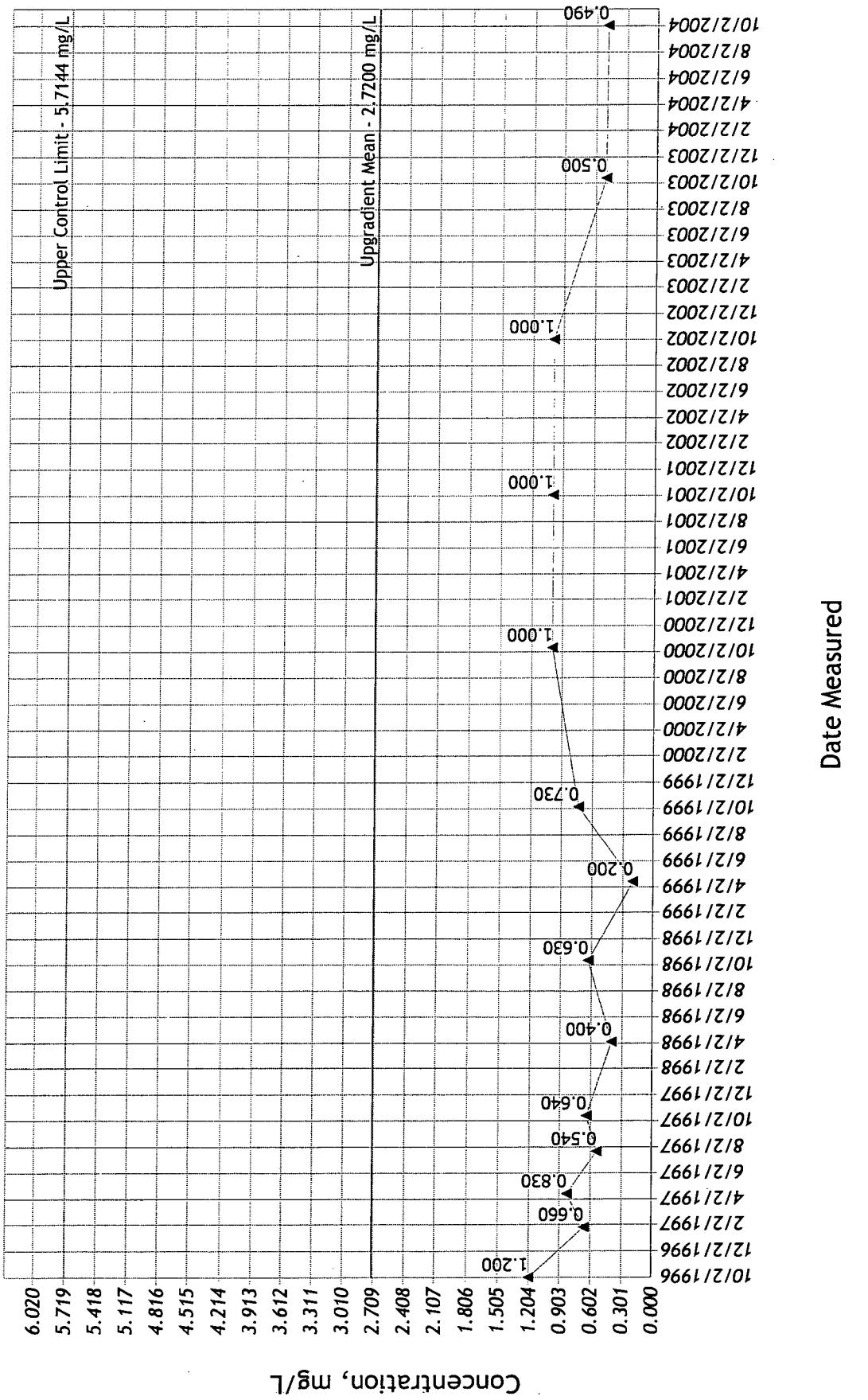


14

Nitrogen, Ammonia  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

04001  
11/10/2004 12:00:43 PM

## Nitrogen, Ammonia Trends - (MW-5)

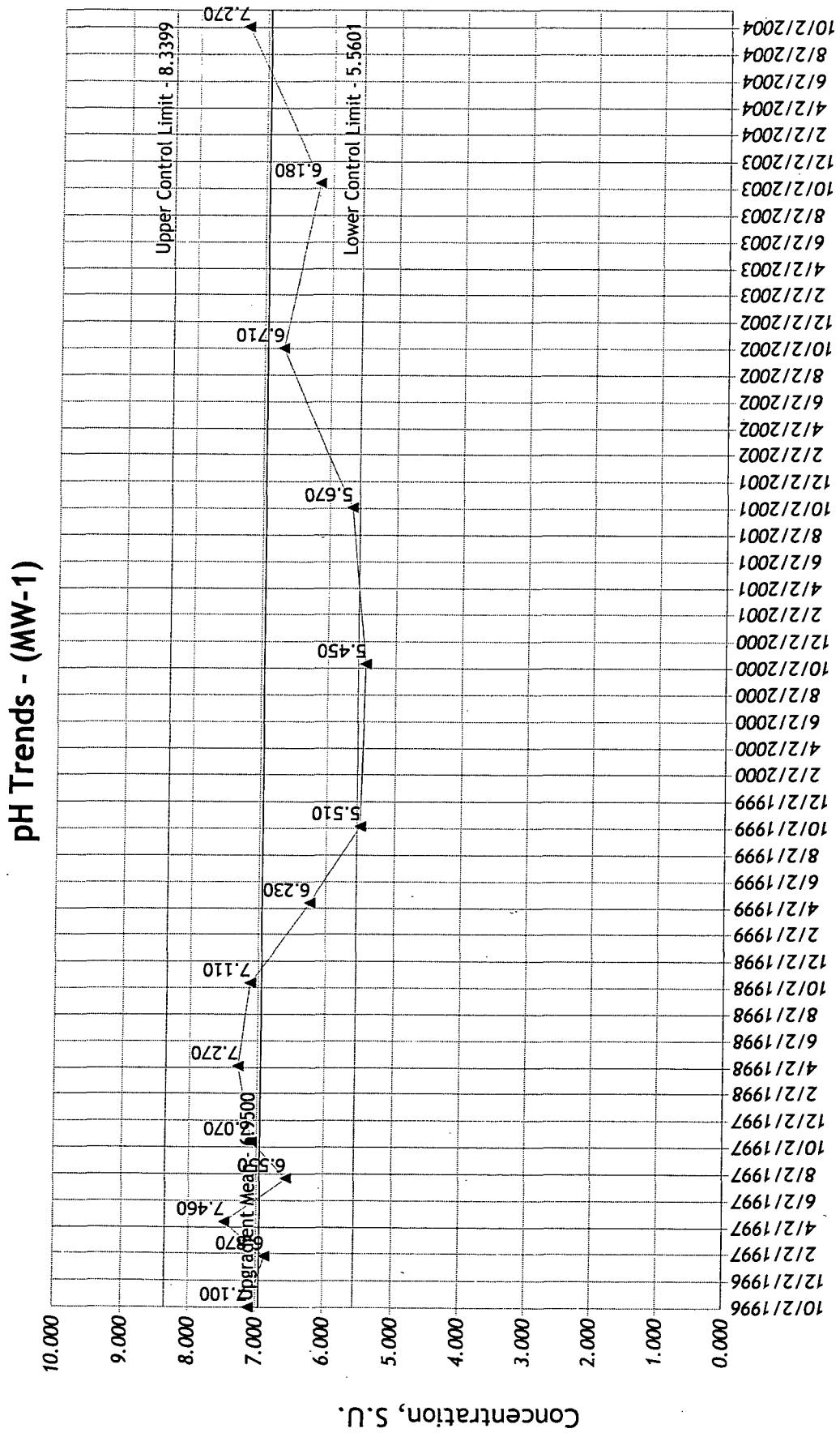


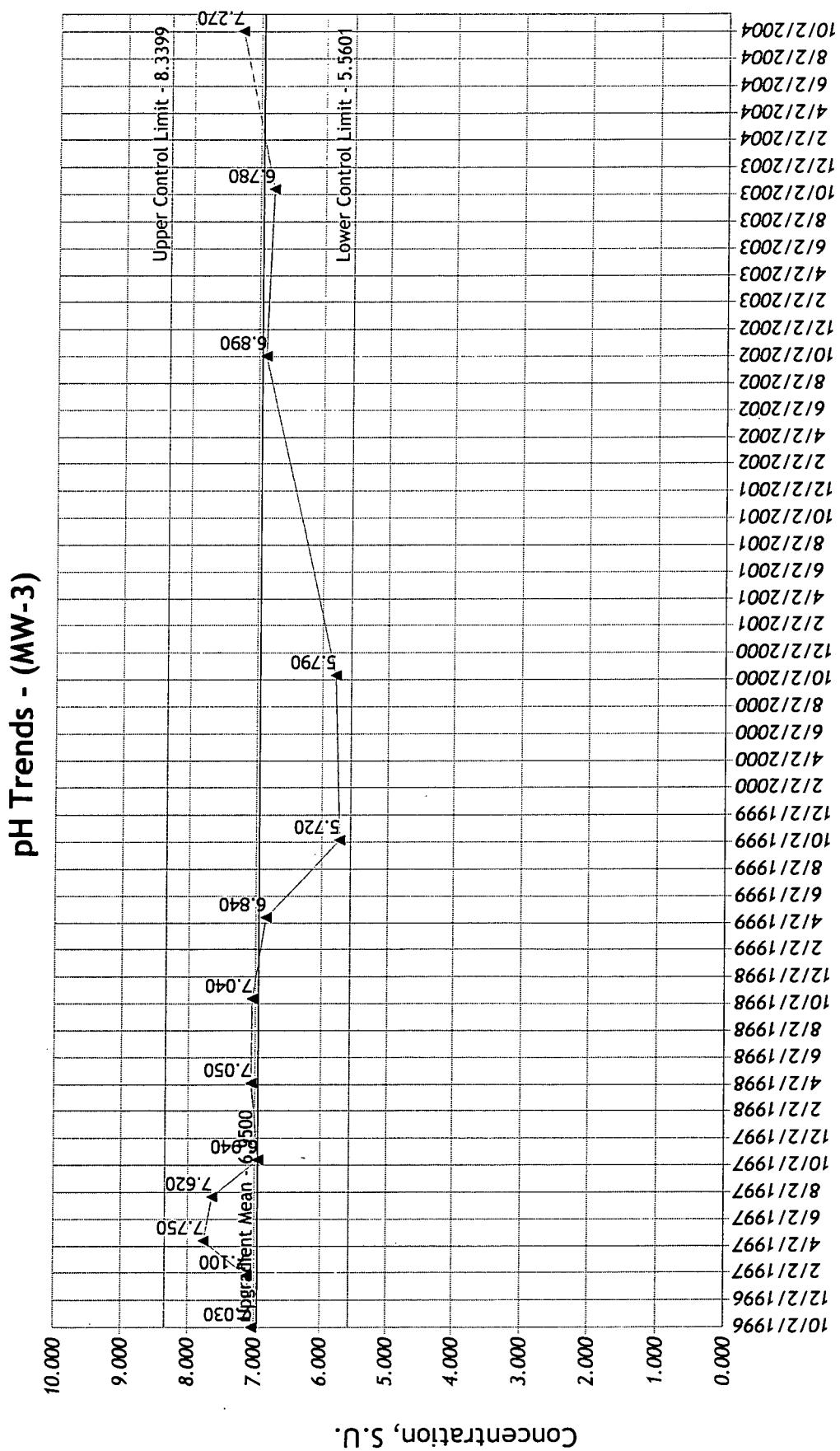
**Nitrogen, Ammonia**  
**Carter Lake Construction and Demolition Landfill**  
78-SDP-02-80

04001  
11/10/2004 12:00:44 PM

**pH**  
**Carter Lake Construction and Demolition Landfill**  
78-SDP-02-80

**16**





**pH**

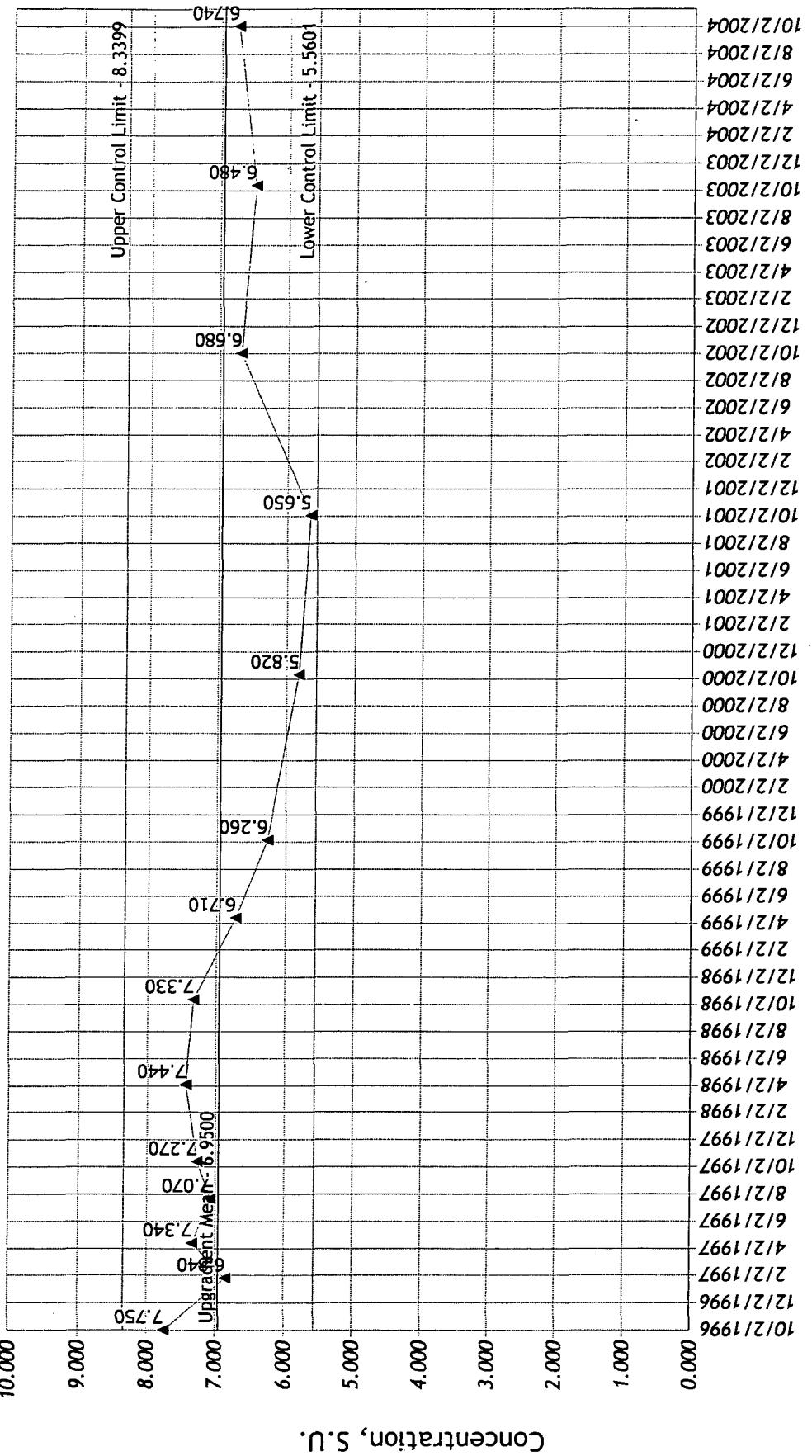
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

**17**

04001

11/10/2004 12:00:44 PM

### pH Trends - (MW-5)

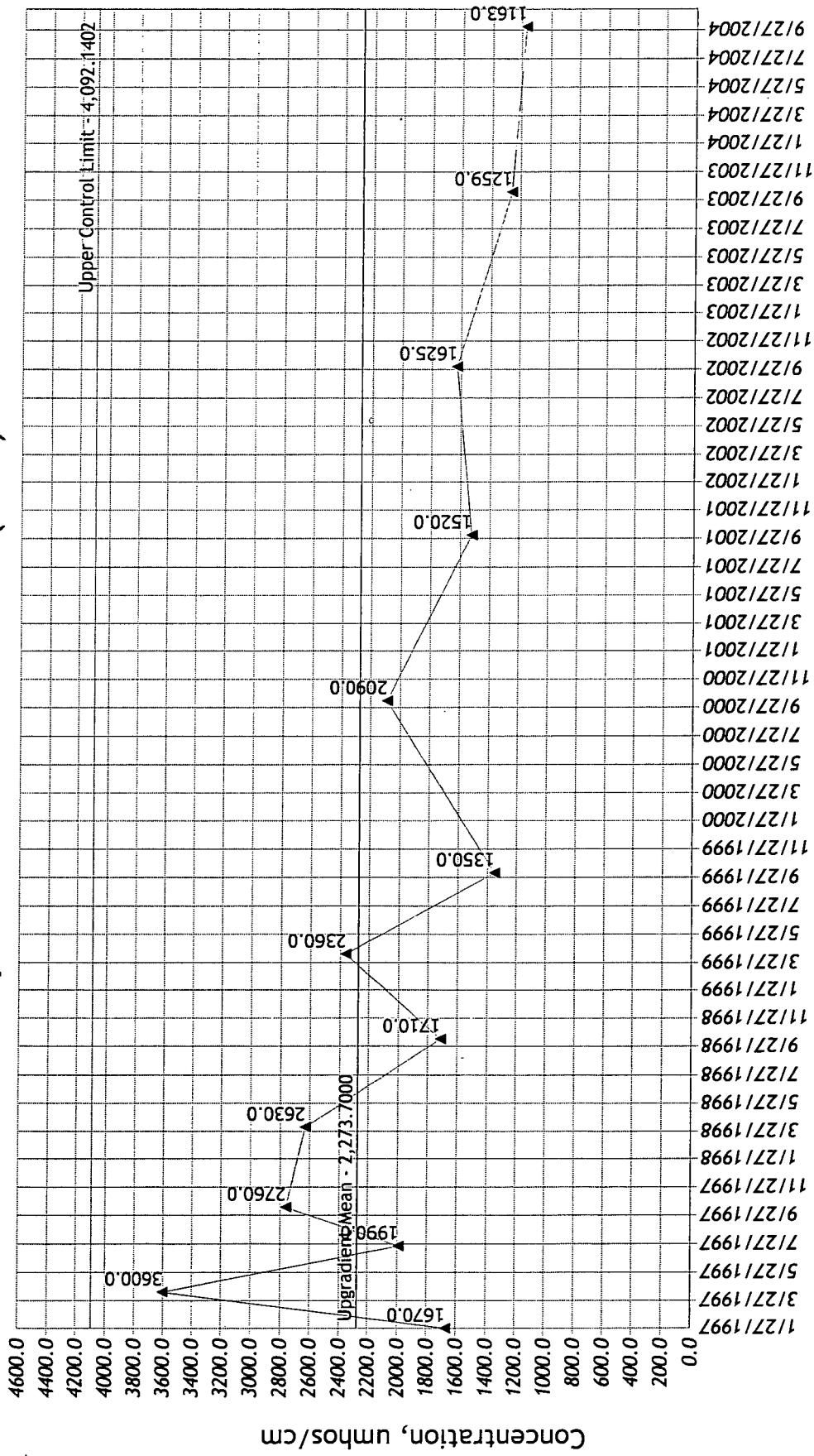


**pH**  
**Carter Lake Construction and Demolition Landfill**  
78-SDP-02-80

**18**

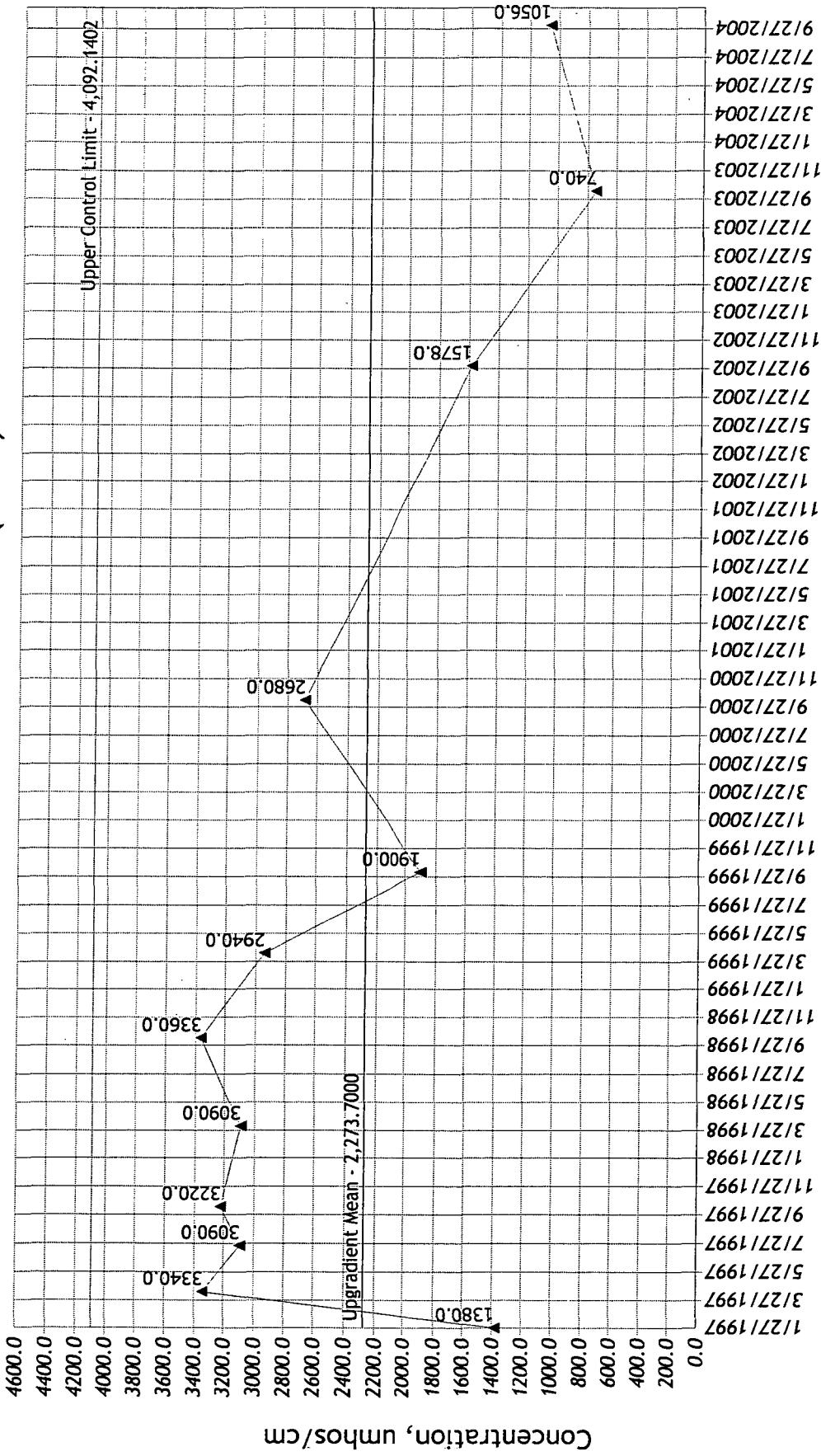
04001  
11/10/2004 12:00:45 PM

### Specific Conductance Trends - (MW-1)



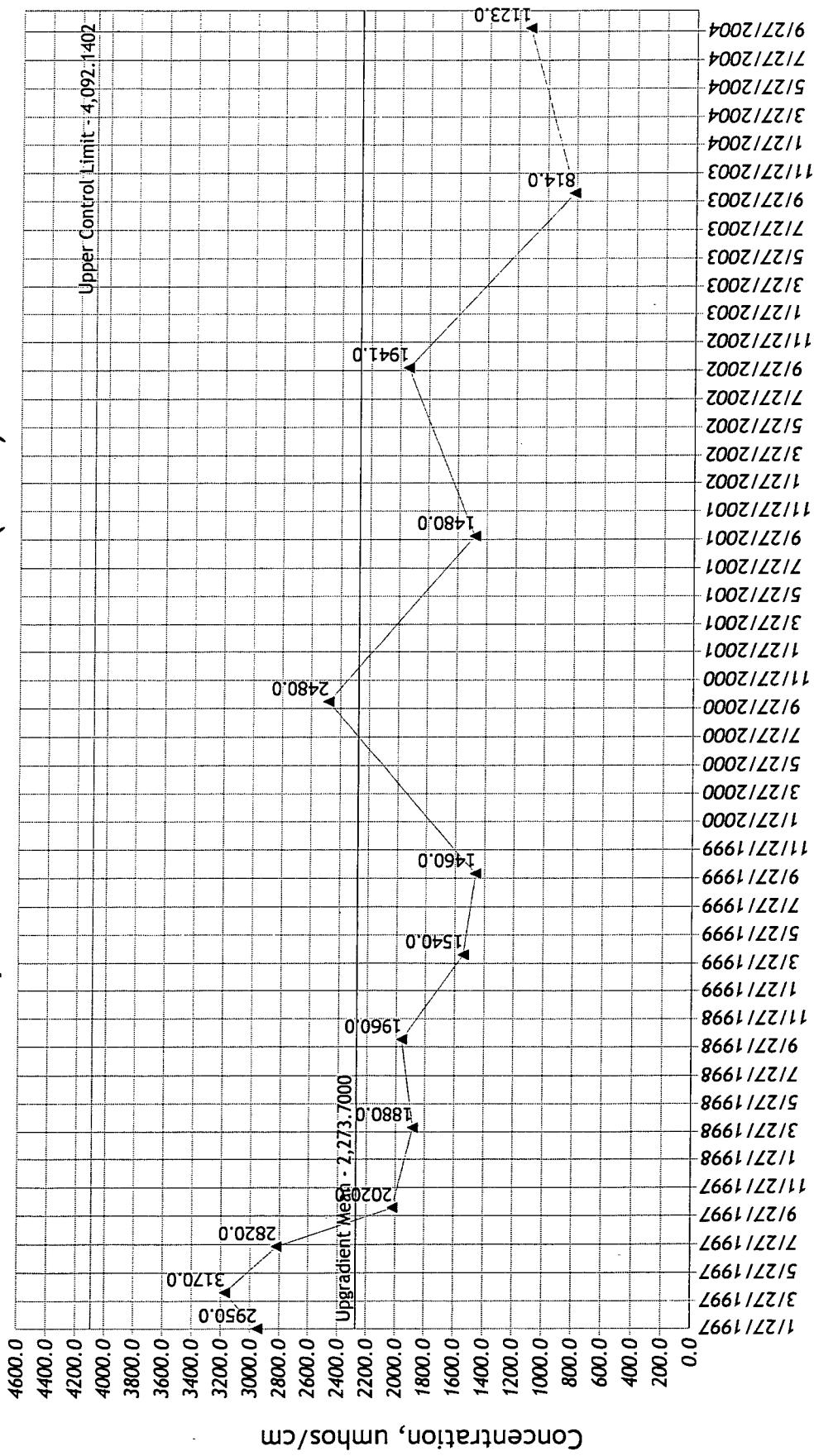
**Specific Conductance  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80**

### Specific Conductance Trends - (MW-3)

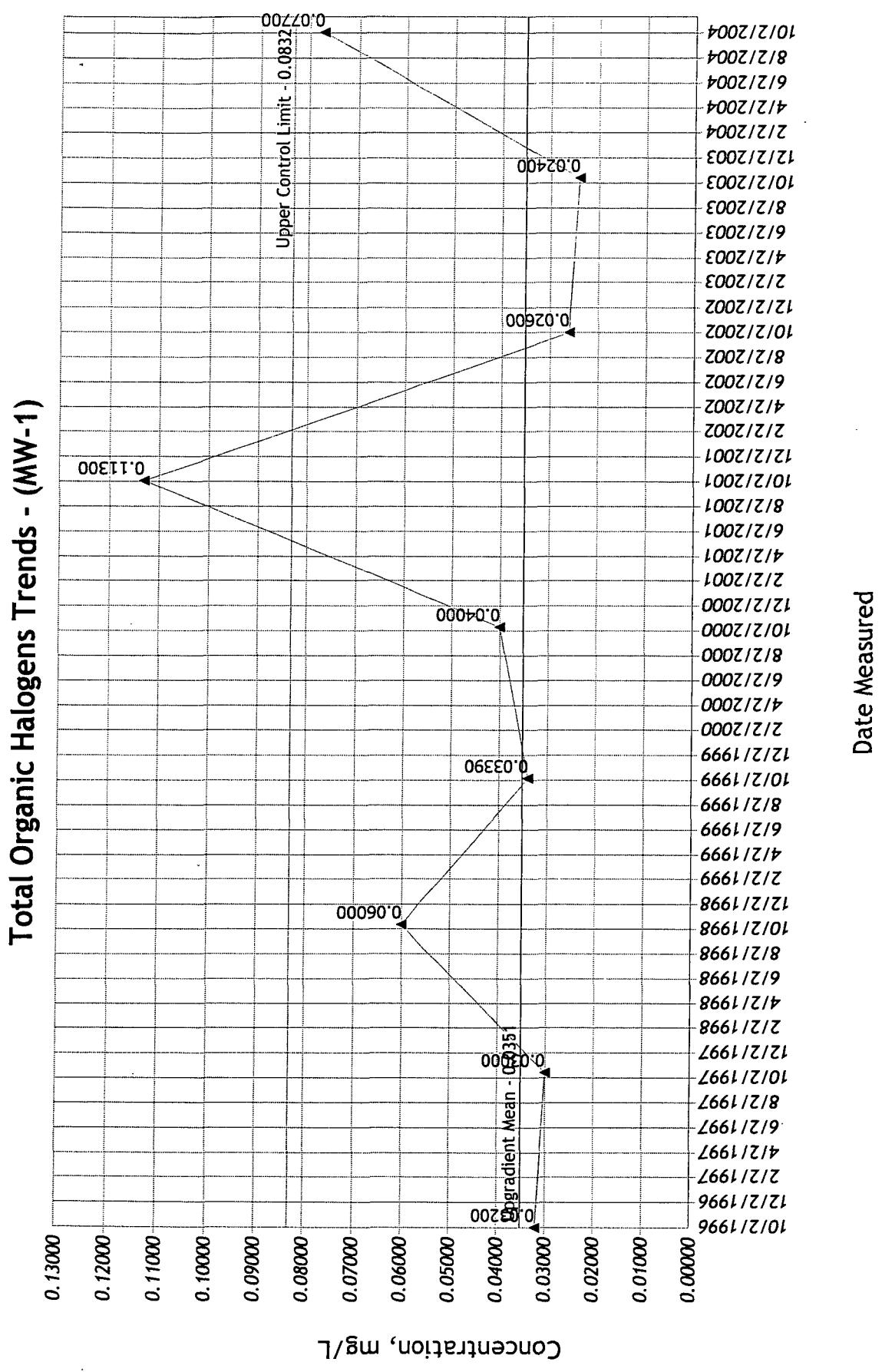


Specific Conductance  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

### Specific Conductance Trends - (MW-5)



Specific Conductance  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80



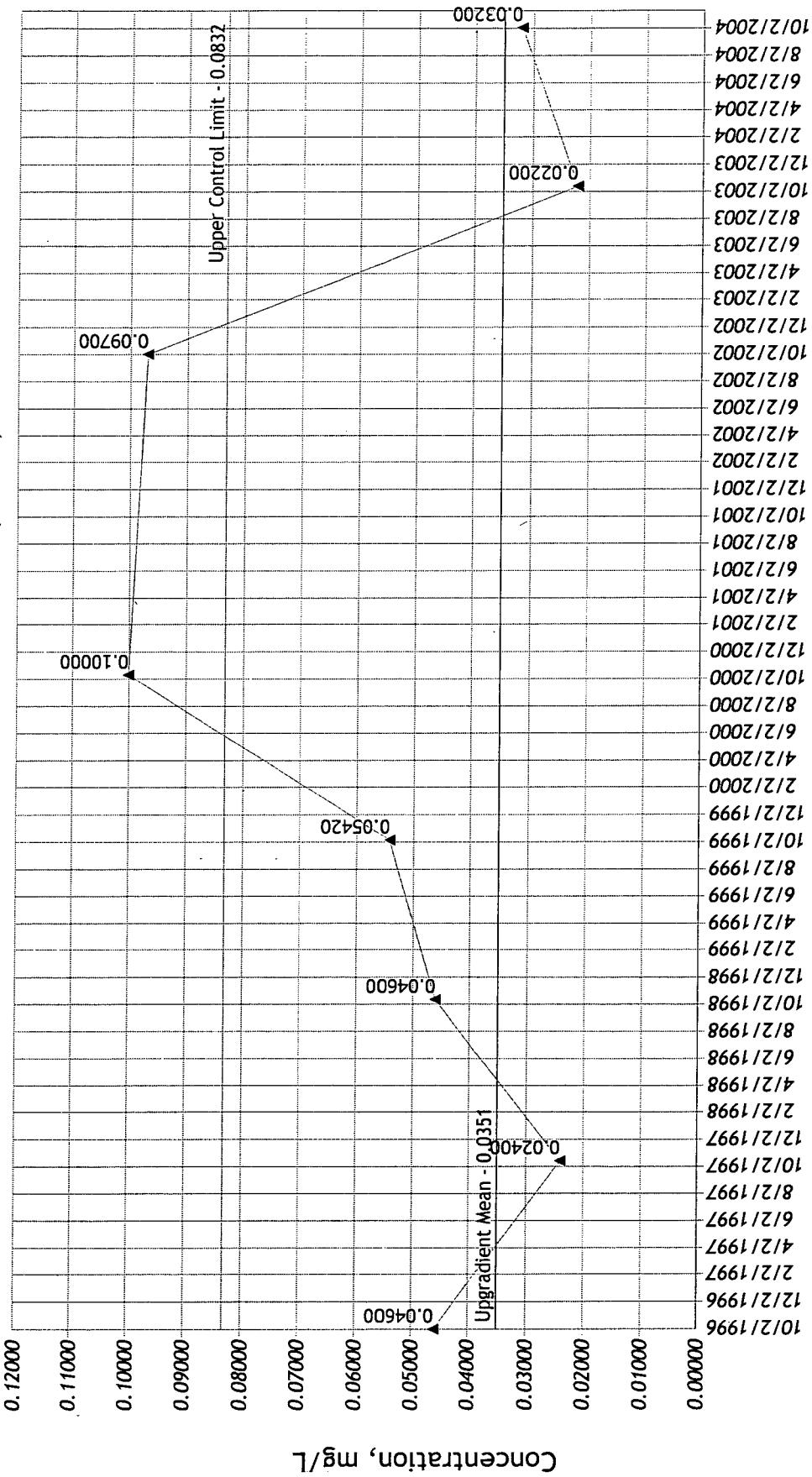
# Total Organic Halogens Carter Lake Construction

78-SDP-02-80

22

11/10/2004 12:00:47 PM

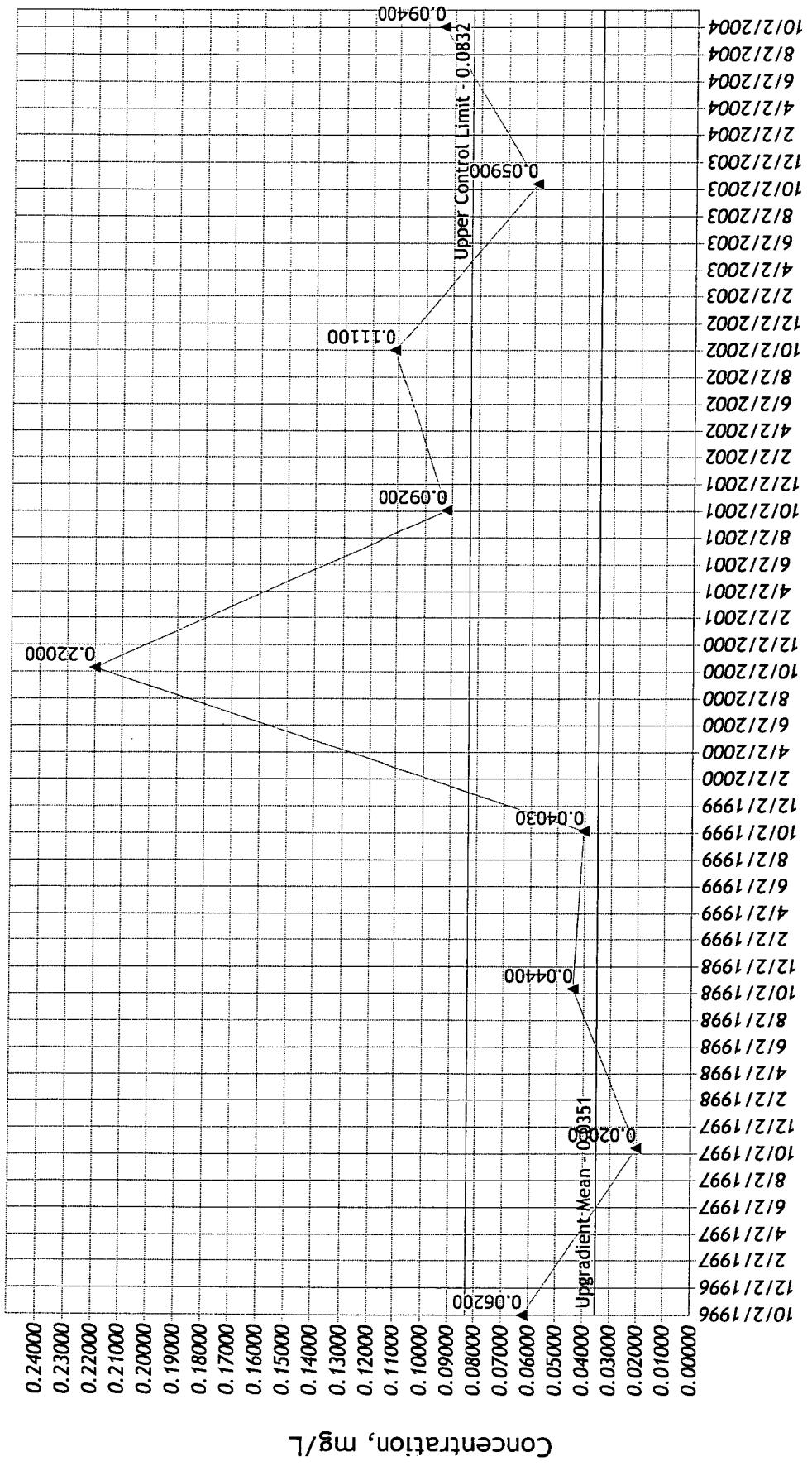
### Total Organic Halogens Trends - (MW-3)



### Total Organic Halogens

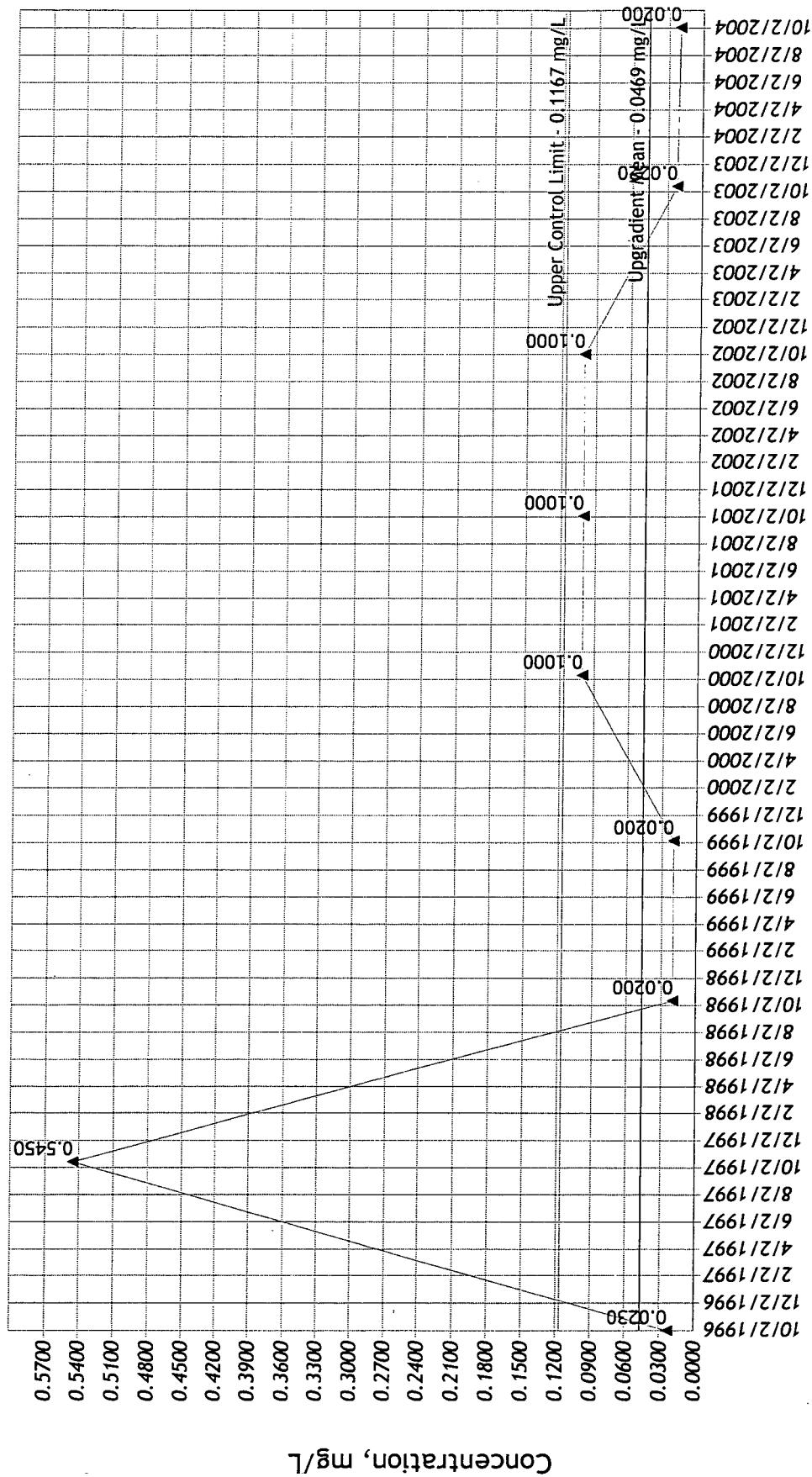
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

### Total Organic Halogens Trends - (MW-5)



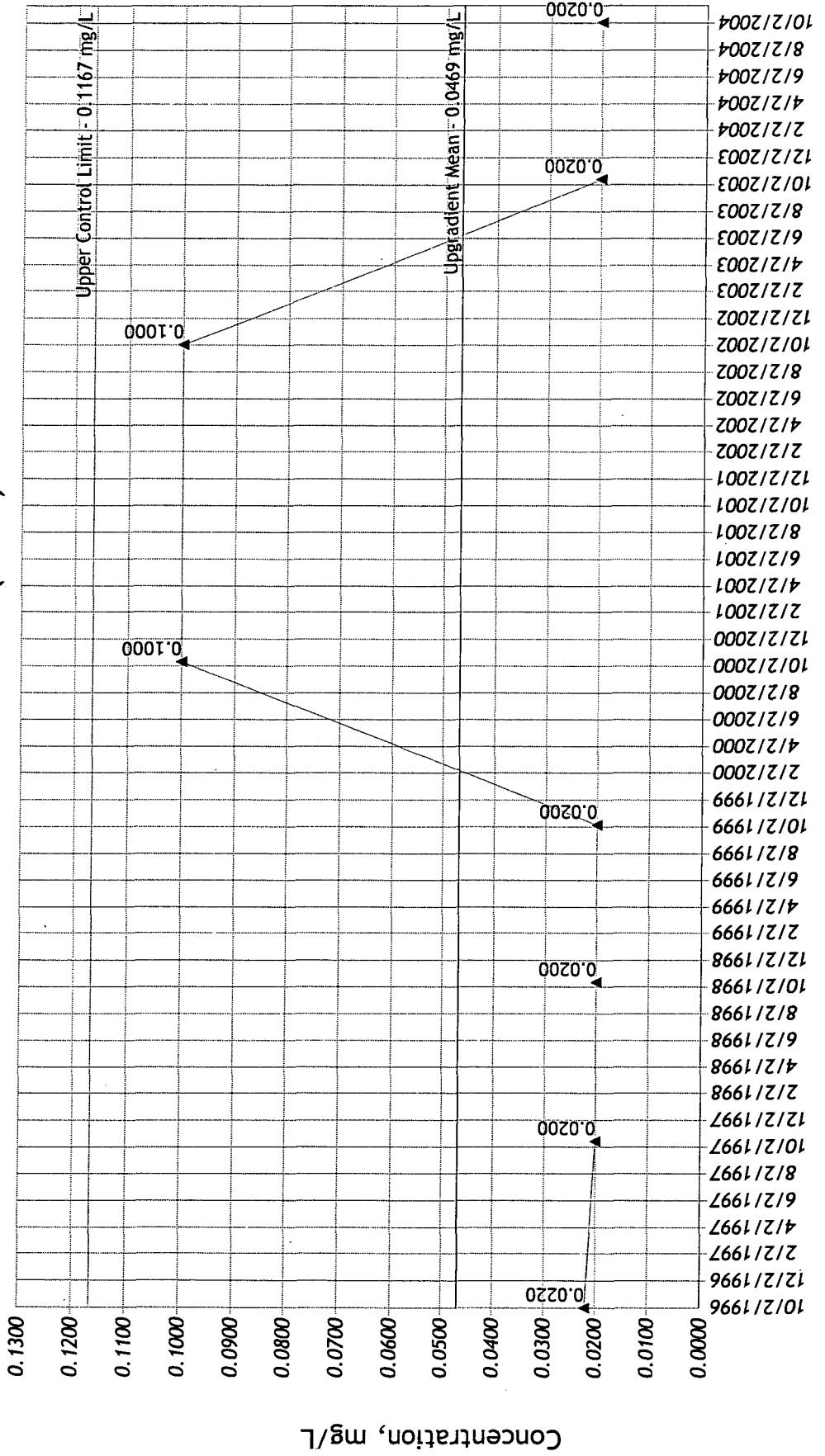
**Total Organic Halogens  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80**

### Total Phenols Trends - (MW-1)



**Total Phenols  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80**

### Total Phenols Trends - (MW-3)



Date Measured

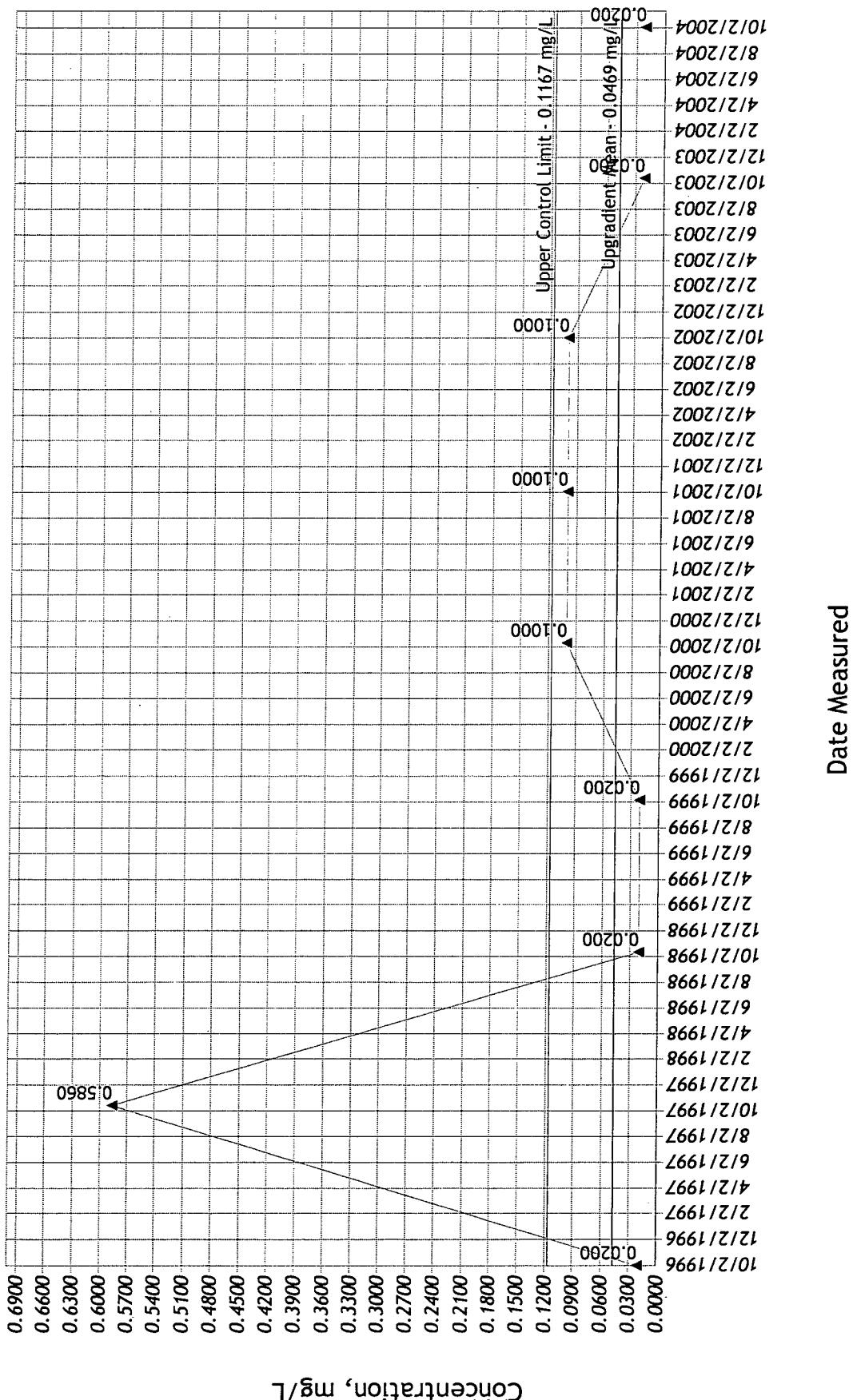
**Total Phenols**  
**Carter Lake Co.**  
78-SDP-02-80

## Total Phenols Carter Lake Construction and Demolition Landfill

04001

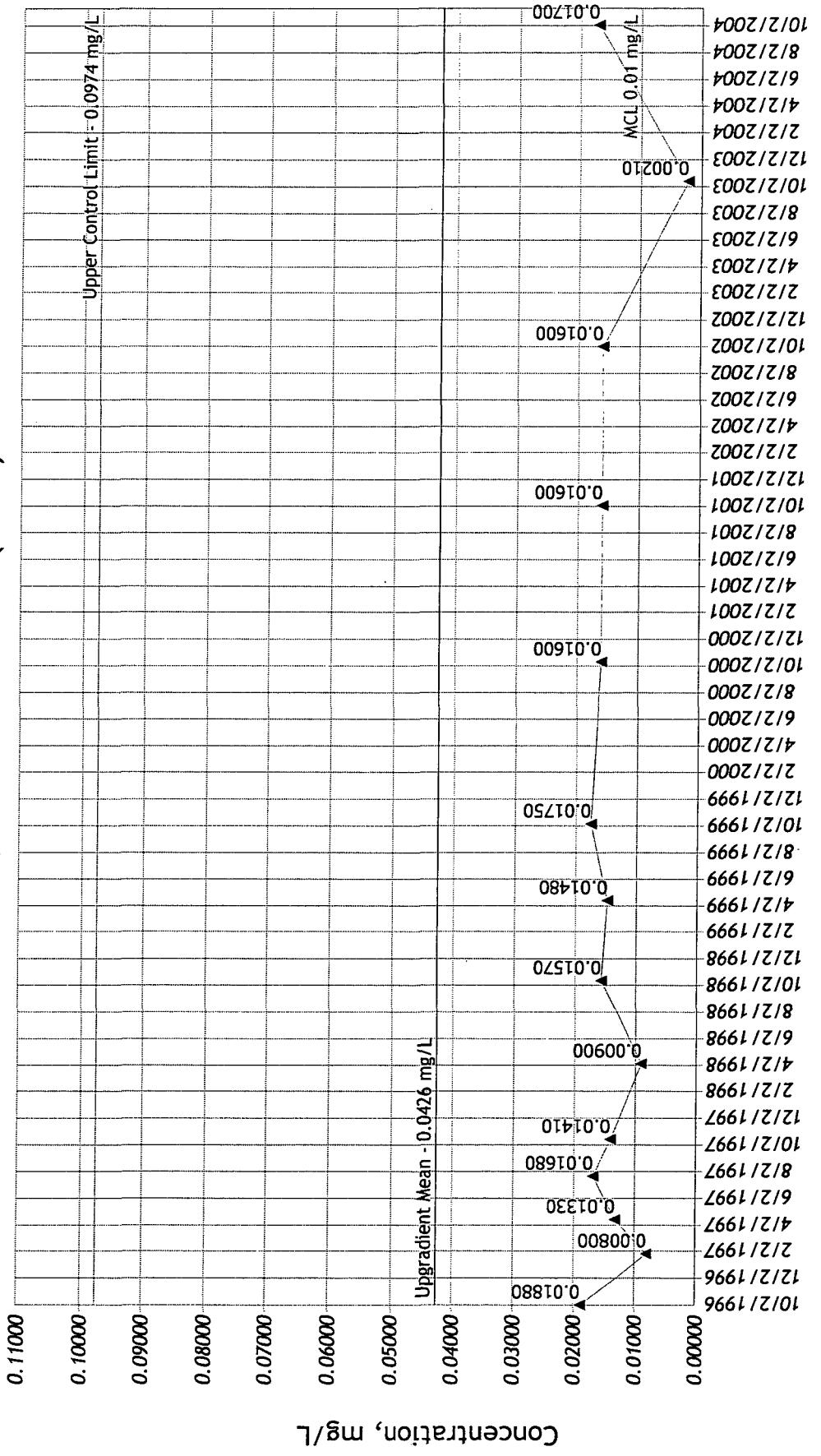
11/10/2004 12:00:49 PM

### Total Phenols Trends - (MW-5)



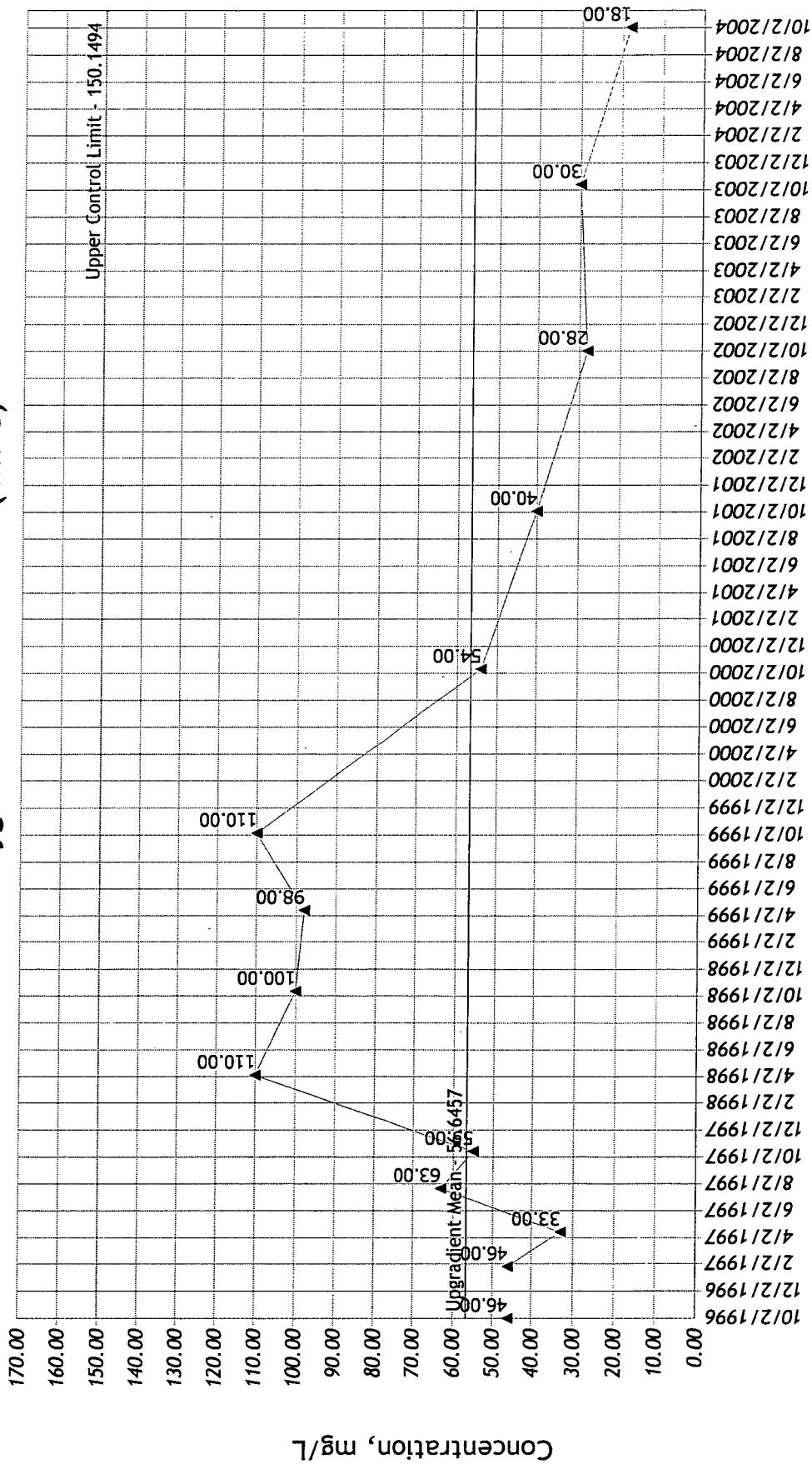
**Total Phenols**  
**Carter Lake Construction and Demolition Landfill**  
78-SDP-02-80

### Arsenic, Dissolved Trends - (MW-8)

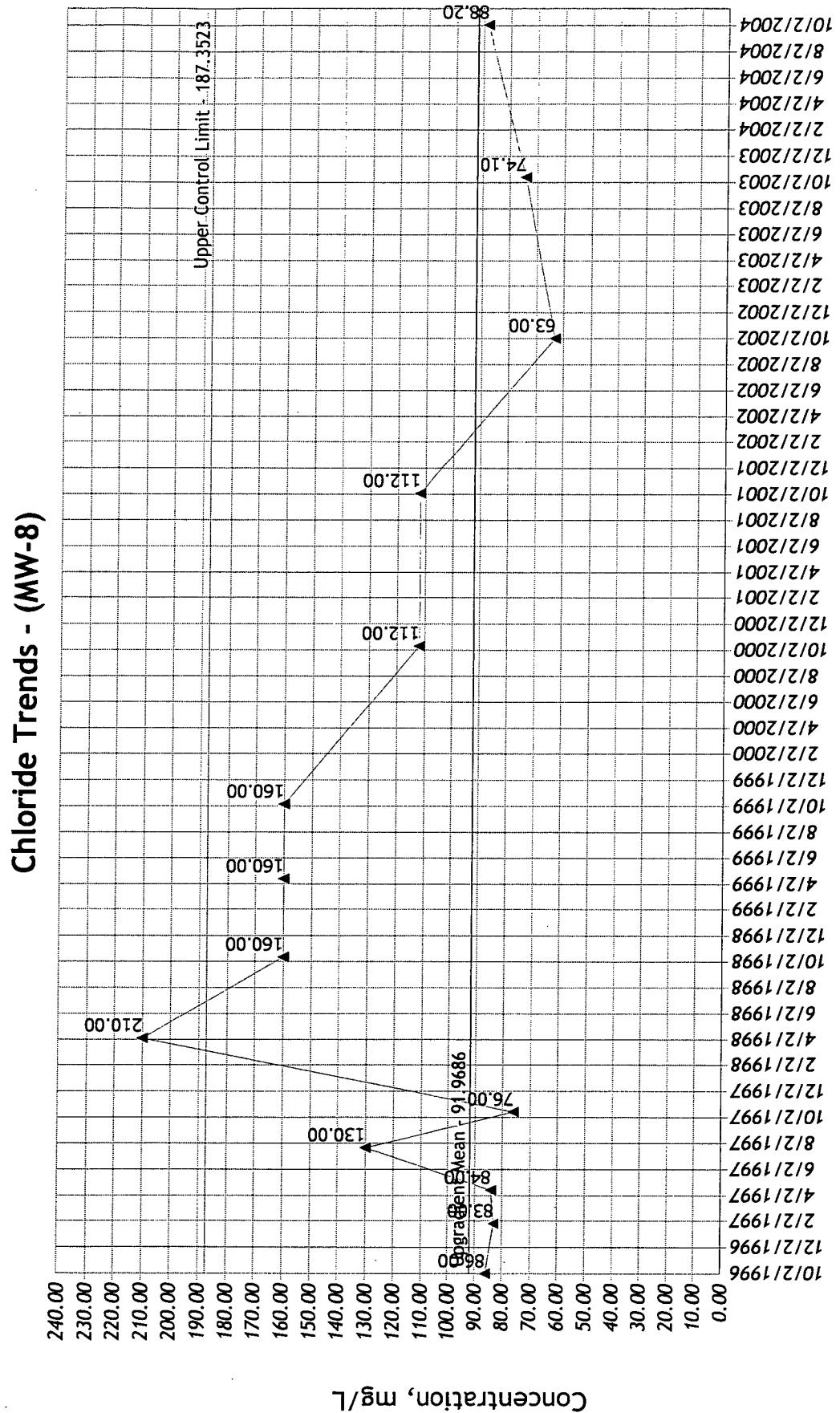


Arsenic, Dissolved  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

### Chemical Oxygen Demand Trends - (MW-8)



**Chemical Oxygen Demand  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80**

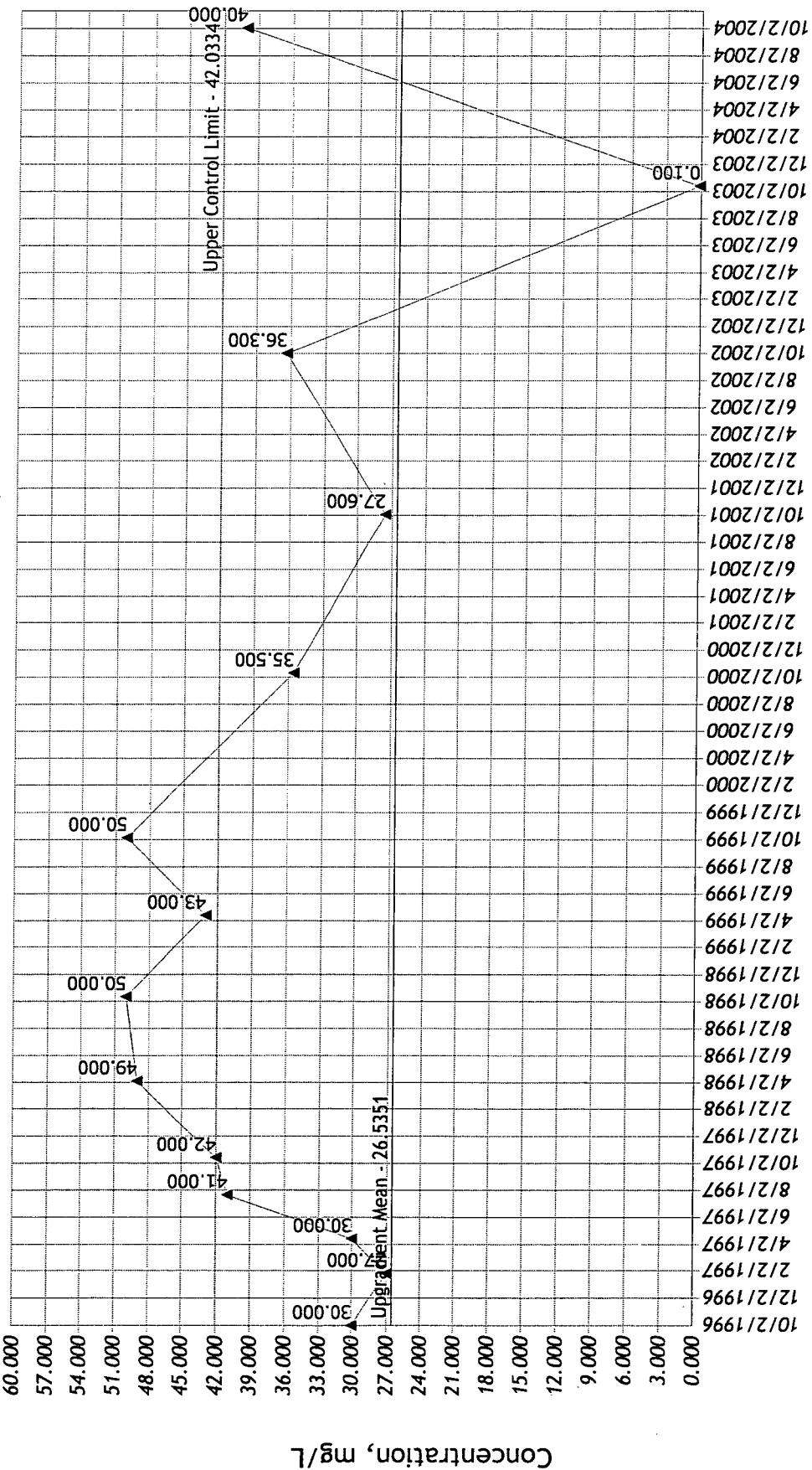


**Chloride  
Carter La  
78-SDP-02-8**

## **Carter Lake Construction and Demolition Landfill**

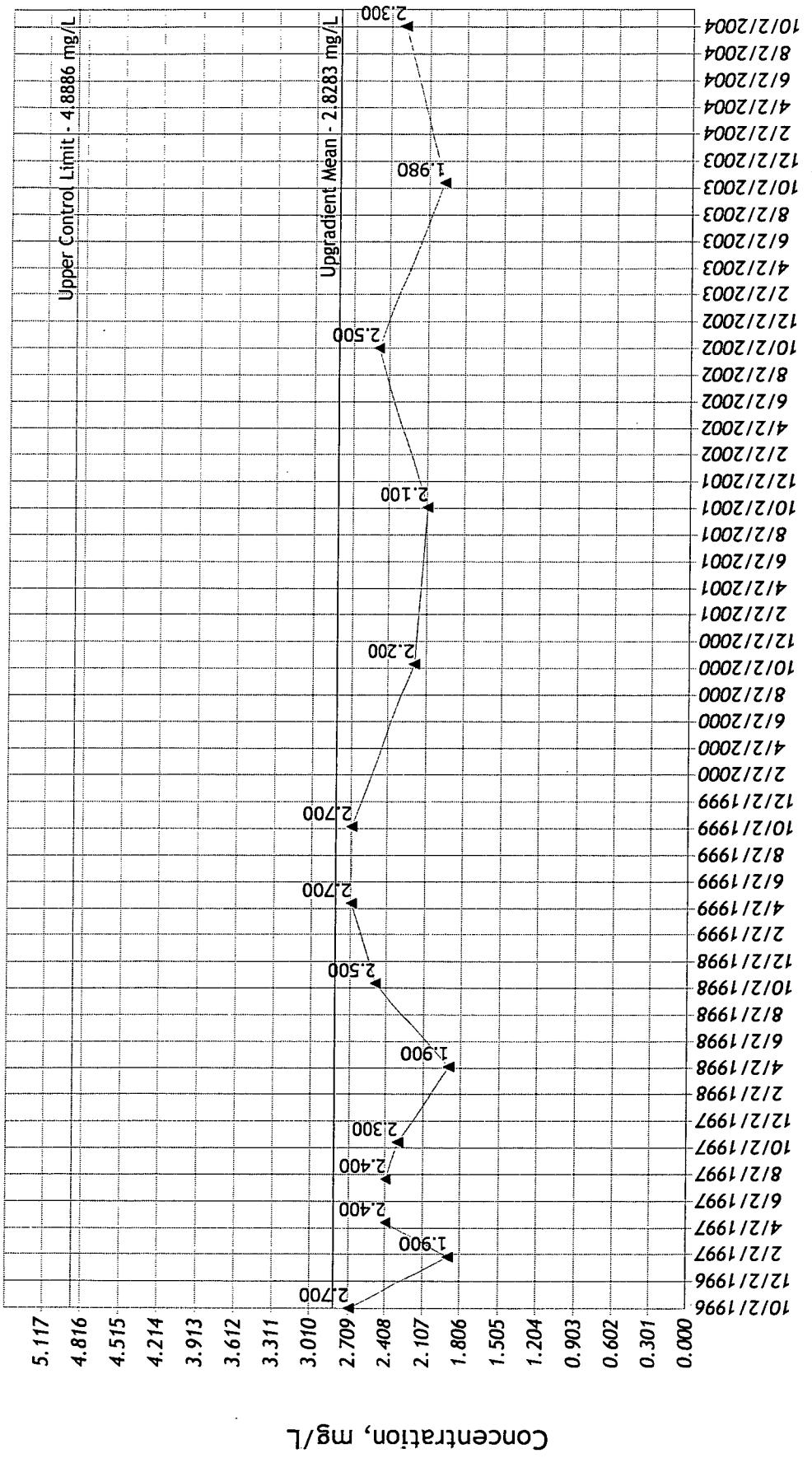
04001  
11/10/2004 12:00:52 PM

### Iron, Dissolved Trends - (MW-8)



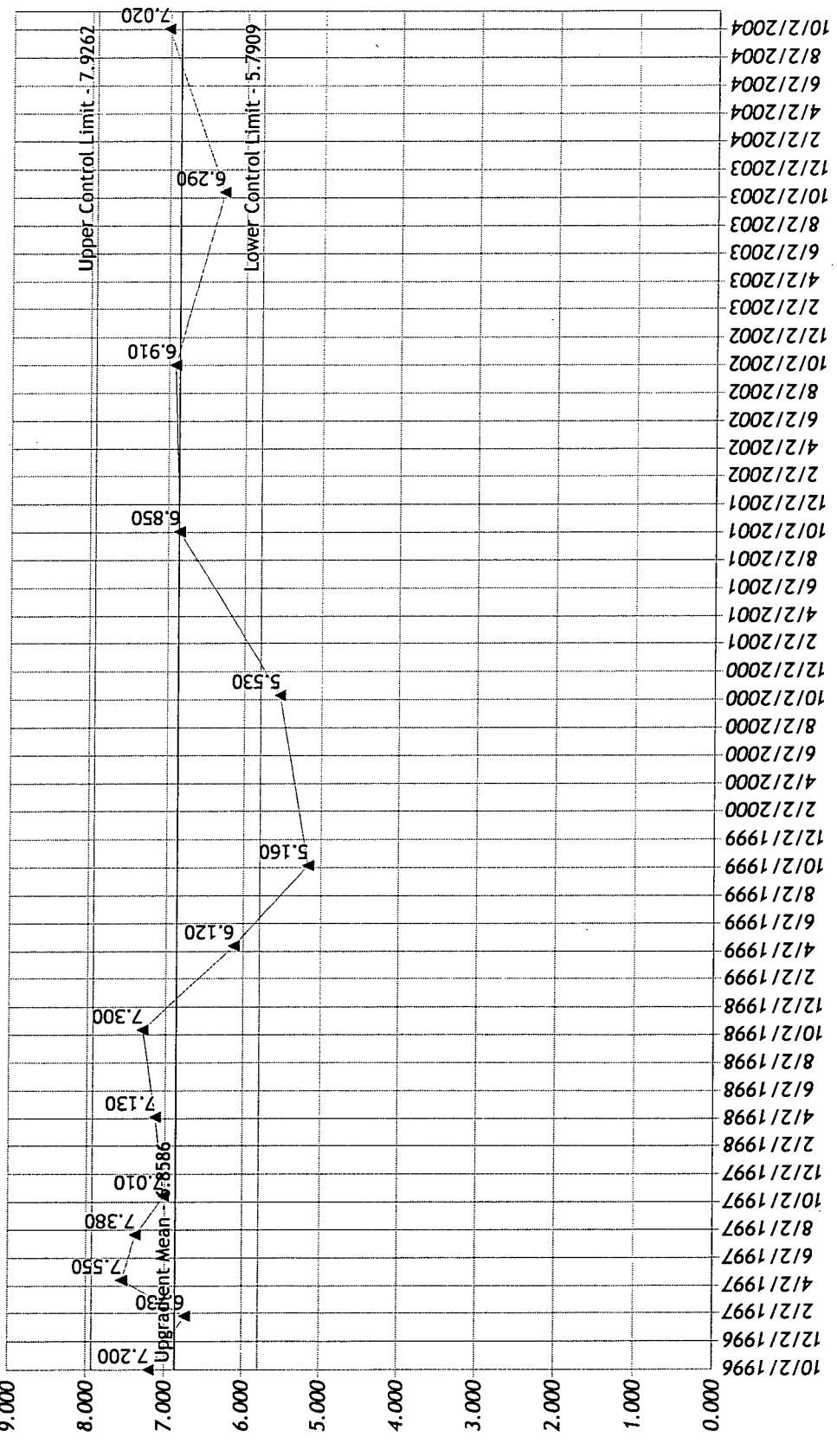
Iron, Dissolved  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

### Nitrogen, Ammonia Trends - (MW-8)



Nitrogen, Ammonia  
Carter Lake Construction and Demolition Landfill  
78-SDP-02-80

### pH Trends - (MW-8)



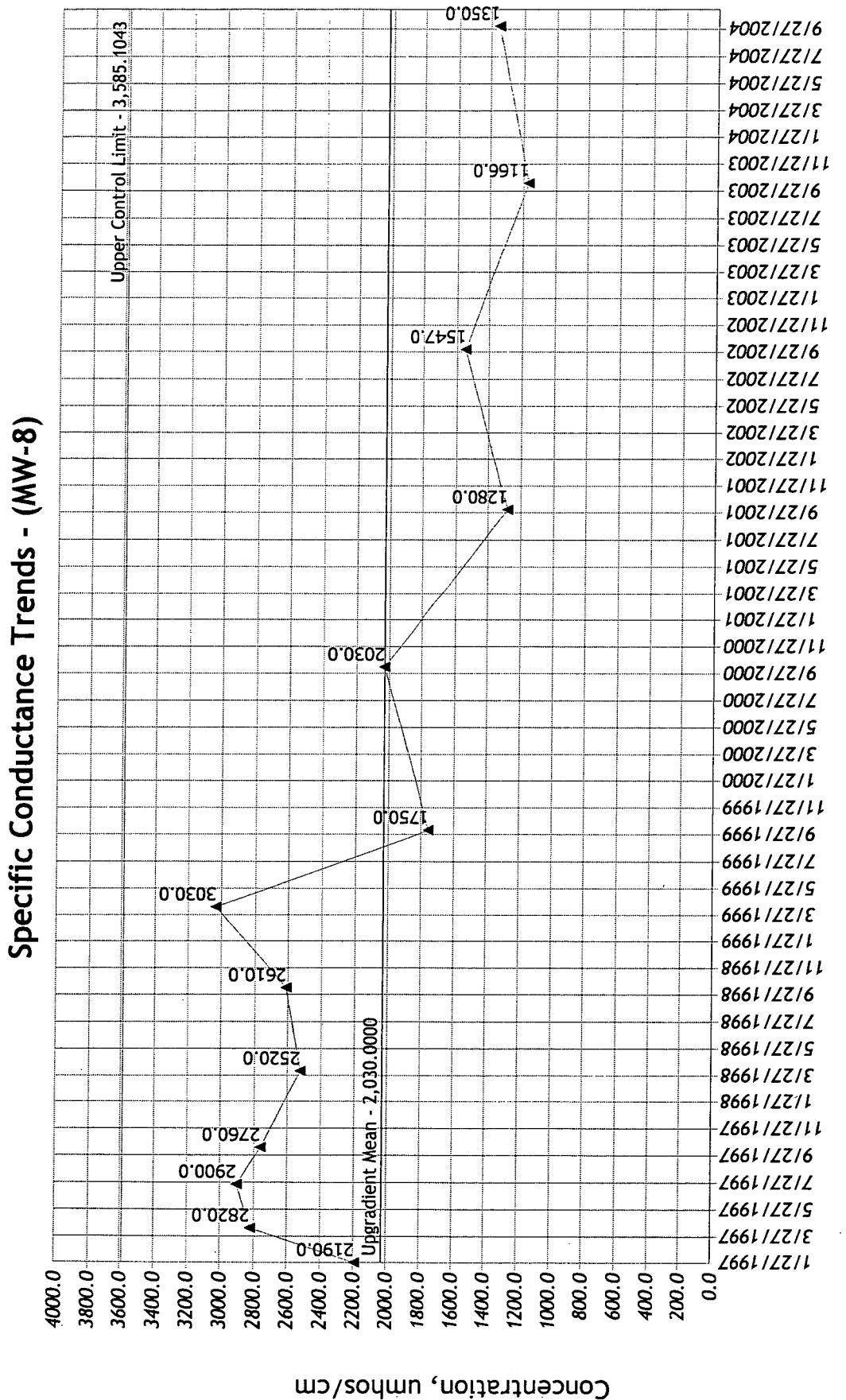
**pH**

78-SDP-02-80

**33**

**Carter Lake Construction and Demolition Landfill**

11/10/2004 12:00:54 PM  
04001



**Specific Conductance  
Carter Lake Construct**  
78-SDP-02-80

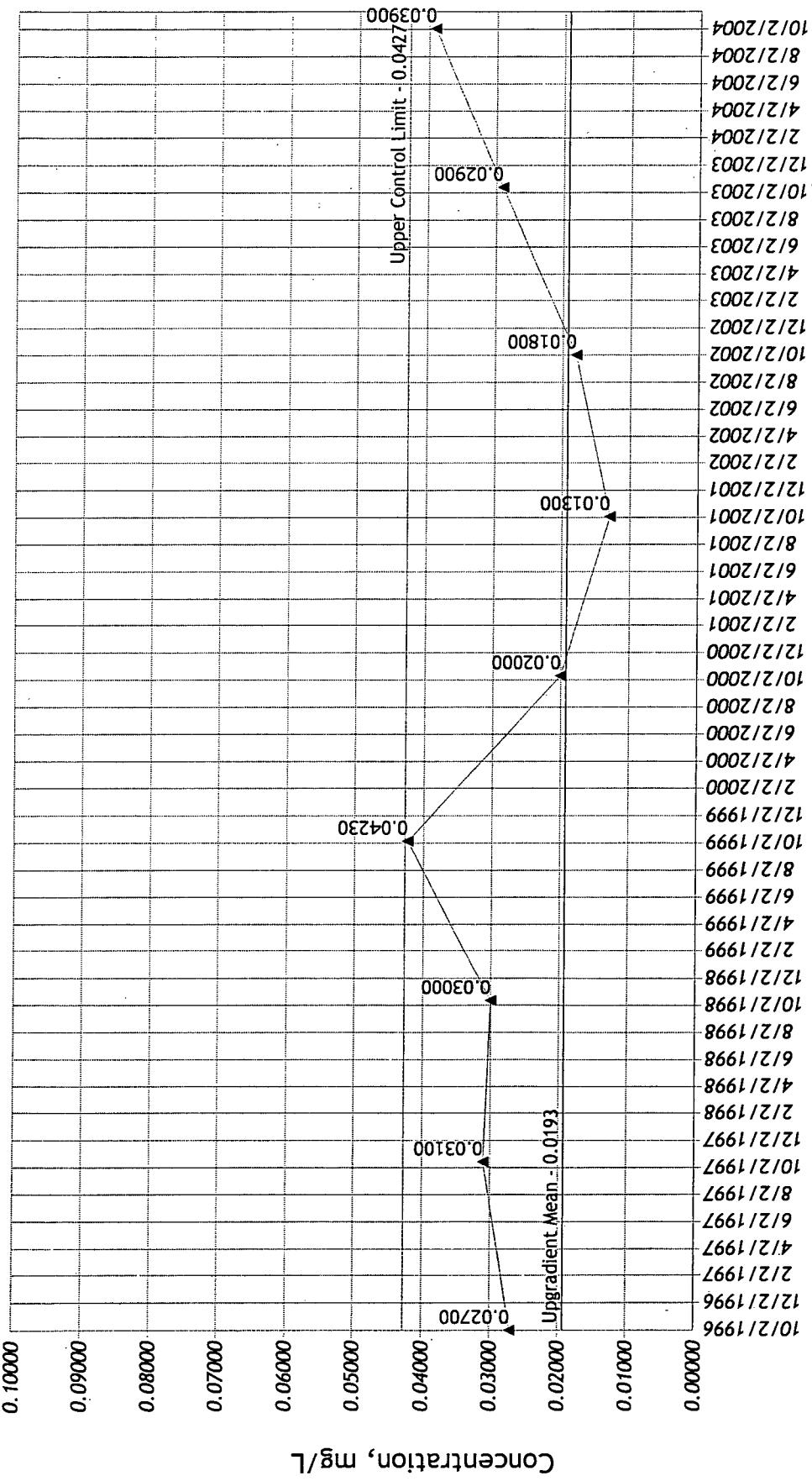
34

**Carter Lake**  
78-SDP-02-80

11/10/2004 12:00:54 PM

Date Measured

### Total Organic Halogens Trends - (MW-8)

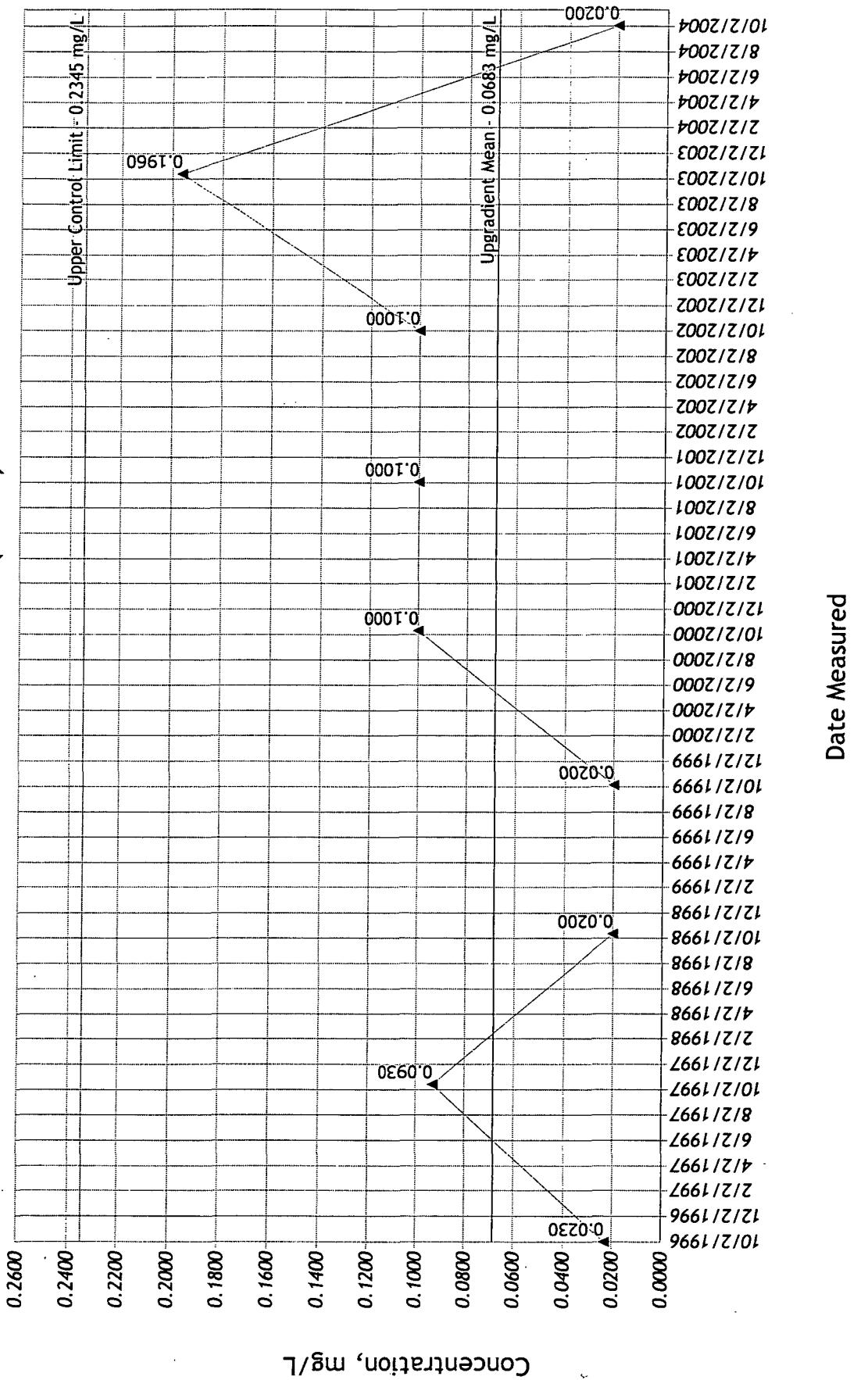


### Total Organic Halogens

### Carter Lake Construction and Demolition Landfill

78-SDP-02-80

### Total Phenols Trends - (MW-8)



**Total Phenols**  
**Carter Lake Construction and Demolition Landfill**  
78-SDP-02-80